

Issue 5.03

Aquamatic Stationary
Wastewater Samplers

AQUA CELL

User Guide





SECTION

CONTENTS KEY FIGURES WARRANTY	0
CONTENTS OF PACKAGE	1
INTRODUCTION	2
CHOOSING A SITE	3
PREPARING THE SITE	4
INSTALLATION	5
OPERATION	6
MAINTENANCE	7
TECHNICAL SPECIFICATION	8



CONTENTS

AQUACELL S50/S100/S200/S300 SERIES WASTEWATER SAMPLER - NEW PRODUCT WARRANTY	i
Discrepancies in Content of Consignment / Damage in Transit	ii
Storage of the Sampler Prior to Installation	ii
CONTENTS OF PACKAGE	1.1
Samplers - S50	1.2
Samplers - S100	1.3
Samplers - S200	1.4
Samplers - S310 / S320	1.5
Samplers - Aquacell S310H/S320H	1.6
Sample Collection Vessels (SCV's)	1.7
Single Container Options	1.7
Bottler Options	1.7
Removable Bottlers	1.7
Integral Bottlers	1.8
Optional Equipment - Electrical	1.8
Optional Equipment - Mechanical	1.10
Consumable Spares	1.10
INTRODUCTION	2.1
The Sampling Process	2.1
Aquacell S50/S100/S200/S300(Series) Samplers	2.2
Aquacell S50 Wastewater Sampler	2.2
Aquacell S100 Wastewater Sampler	2.3
Aquacell S200 Wastewater Sampler	2.3
Aquacell S300 Series Wastewater Samplers	2.4
Aquacell S310 Wastewater Sampler	2.4
Aquacell S320 Wastewater Sampler	2.4
Aquacell S310H Wastewater Sampler	2.4
Aquacell S320H Wastewater Sampler	2.5
The Pressurised Pipeline Interface (PPI)	2.5
Wastewater Drain	2.5

Condensate Drain (S320 & S320H only)	2.6
The User Guide	2.6
Safety First	2.6
Infection	2.6
Electrical	2.7
Mechanical	2.7
 CHOOSING A SITE	 3.1
Environmental Considerations	3.1
Non-pressurised Sampling Points	3.1
Pressurised Sampling Points	3.3
 PREPARING THE SITE	 4.1
Aquacell S50 Sampler	4.1
Sampler / Sample Collection Vessel Location	4.2
Gravity Drain (Wastewater) Installation (if required)	4.2
Electrical Power Supply Installation	4.2
(Optional) Ancillary Signal Connection	4.3
Aquacell S100 Sampler	4.5
Sampler / Sample Collection Vessel Location	4.6
Gravity Drain (Wastewater) Installation (if required)	4.6
Electrical Power Supply Installation	4.6
(Optional) Ancillary Signal Connection	4.7
Aquacell S200 Sampler	4.9
Sampler Location	4.10
Electrical Power Supply Installation	4.10
(Optional) Ancillary Signal Connection	4.10
Aquacell S300 Series Samplers	4.12
Sampler Location	4.14
Gravity Drain (Condensate) Installation (if required)	4.14
(Optional) Condensate Evaporator Tray Installation	4.14
Gravity Drain (Wastewater) Installation (if required)	4.14
Gravity Drain for Self Emptying Bottler (if required)	4.15
Electrical Power Supply Installation	4.15
Auxiliary Equipment Installation	4.15
(Optional) Ancillary Signal Connection	4.15
(Optional) Auxiliary Equipment Mounting Plate	4.16
(Optional) Auxiliary Equipment Enclosure	4.16

Pressurised Pipeline Interface (PPI) - Standard Version	4.20
PPI Location	4.21
Gravity Drain Installation	4.21
Installing the Pressure Tapping	4.21
Electrical Power Supply Installation	4.21
Pressurised Pipeline Interface (PPI) - S300 Version	4.22
Gravity Drain Installation	4.23
Installing the Pressure Tapping	4.23
INSTALLATION	5.1
Aquacell S50 Sampler	5.1
Sampler	5.1
Sample Collection Vessel (SCV)	5.2
Electrical Connections to the Sampler Module	5.2
Aquacell S100 Sampler	5.4
Sampler	5.4
Sample Collection Vessel (SCV)	5.4
Electrical Connections to the Sampler Module	5.5
Aquacell S200 Series Samplers	5.7
Sampler	5.7
Sample Collection Vessel (SCV)	5.7
Electrical Connections to the Sampler Module	5.8
Aquacell S300 Series Samplers	5.10
Sampler	5.10
Sample Collection Vessel (SCV)	5.10
Single Containers / Detachable Bottlers	5.10
Integral Bottlers	5.11
(Optional) Auxiliary Equipment Mounting Plate	5.11
(Optional) Auxiliary Equipment Enclosure	5.11
Pressurised Pipeline Interface - Standard Version	5.13
Pressurised Pipeline Interface - S300 Version	5.13
Intake Hose Installation	5.14
Non Pressurised Sampling Points	5.14
Installation Procedure:	5.14
S50 Sampler	5.15
S100 and S200 Samplers	5.15
S300 Series Samplers	5.16
Pressurised Sampling Points - Samplers incorporating The	

Pressurised Pipeline Interface (PPI).....	5.17
Installation Procedure:	5.17
(Optional) Back-up Battery Installation	5.18
S50 / S200 Samplers.....	5.18
S100 Sampler	5.18
S300 Series Samplers	5.18
 OPERATION	 6.1
Definitions	6.1
Basic Operations	6.3
Controlling the Sampler	6.3
Operating Buttons	6.3
Programming Buttons	6.3
Switching on the Power	6.4
Sampler Module, Initialization Sequence	6.4
S50 / S100 / S200 / S310 (Basic Model) Samplers.....	6.4
S310 with optional Beacon and/or Interior Light / S310H / S320 / S320H Samplers.....	6.4
Heating / Cooling Component Start-up	6.5
S50 / S100 / S310 Samplers	6.5
S200 Samplers	6.5
S310H / S320 / S320H Samplers.....	6.6
Switching on the (Optional) Back-Up Battery	6.7
Basic (For S50, S100 and S200 Samplers).....	6.7
S300 Series.....	6.7
Taking a Spot Sample	6.7
Basic Aquacell Sampler	6.8
Aquacell Sampler in PPI mode	6.9
Setting the Purge Times - Basic Aquacell Sampler	6.10
Setting the Flush Time - PPI.....	6.11
Removing / Refitting the Sample Chamber	6.13
Changing the Sample Shot Volume.....	6.15
Precision Sample Shot Volumes	6.16
Sampling Frequency.....	6.16
Distributor Pipe Alignment	6.17
Advanced operations	6.18
Programming the Sampler.....	6.19
System Settings - General.....	6.21
Systems Settings - Sampler	6.22
System Settings - Bottler	6.28

Program Settings - Sampler	6.31
Special Options	6.34
Program Settings - Bottler	6.34
Special Options Indication	6.35
Running the Program	6.36
Taking Spot Samples During a Sampling Program	6.37
Bottlers	6.38
Detachable Bottlers	6.38
Self-Emptying Bottler	6.38
Leaving the Sampler to Operate Automatically	6.40
Returning to Collect Samples	6.40
Data Logging / Communication Facilities	6.41
Sample Temperature Monitoring (Option)	6.41
Sampling Events	6.42
Warning Events	6.44
Warning Event occurrences, out of the Event Logging Phase	6.50
Warning Event occurrences during the Event Logging Phase	6.50
Warning Event occurrences whilst a Spot Sample is being taken, during the Event Logging Phase	6.51
Viewing the Program Settings and Progress	6.51
Escaping from the VIEW status	6.54
Downloading the Samplers Event and Sample Temperature logs to a Computer	6.55
Initial Preparations	6.55
Stage 1	6.55
Stage 2	6.56
Configuring a Hyper Terminal Connection	6.56
Starting a Hyperterminal Download Session	6.57
Giving the Sampler a name	6.58
Configuring the text file in which the data will be captured	6.58
Downloading the Event Log	6.59
Downloading the Sample Temperature Log	6.60
Closing down	6.62
A Few simple DO'S and DON'TS when operating your Sampler	6.63
Do's	6.63
Don'ts	6.63
MAINTENANCE	7.1
General	7.1

Maintenance Contract	7.1
User Maintenance	7.1
Cleaning The Sample Tract	7.2
Intake Hose Assembly	7.3
Sample Chamber / Chamber Top	7.3
Sample Collection Vessel	7.4
10 Litre Polypropylene Container Format:	7.4
12 x 0.75 Litre Glass Bottler Format:	7.4
12 x 1 Litre P.E.T. Bottler Format:	7.4
Bottler Distributor Pipe.....	7.4
Keeping the Inside of the Sampler Module Dry	7.4
Test Mode	7.5
Breakdown Service	7.8
On-Site Service	7.8
Back to Base Service	7.9
Sampler Module.....	7.9
Removable Bottler.....	7.9
Other faulty hardware which is readily detachable	7.9
Trouble Shooting	7.10
TECHNICAL SPECIFICATIONS	8.1
Aquacell Sampler Module	8.1
Materials of construction.....	8.2
Mechanical Features	8.2
Optional Connections	8.2
Ancillary Signal Connection	8.2
USB Connection	8.3
Pressurised Pipeline Interface (PPI)	8.3
Aquacell Wastewater Sampler Model Range	8.5
Standards Compliance	8.5
Data Table	8.5

KEY FIGURES

Figure 3.A: Intake Hose Geometry	3.2
Figure 4.A: Installation Drawing, S50 Sampler	4.1
Figure 4.B: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S50 Sampler	4.4
Figure 4.C: Installation Drawing, S100 Sampler	4.5
Figure 4.D: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S100 Sampler	4.8
Figure 4.E: Installation Drawing, S200 Sampler	4.9
Figure 4.F: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S200 Sampler	4.11
Figure 4.G: Installation Drawing, S300 Sampler - Top, Left Side and Front Views	4.12
Figure 4.H: Installation Drawing, S300 Sampler - Right Side and Rear Views	4.13
Figure 4.I: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S300 Series Samplers	4.18
Figure 4.J: Wiring Details - (Optional) Auxiliary Equipment Mounting Plate/(Optional) Auxiliary Equipment Enclosure	4.19
Figure 4.K: Installation Drawing, Pressurised Pipeline Interface - Standard Version	4.20
Figure 4.L: Installation Drawing, Pressurised Pipeline Interface - S300 Version	4.22
Figure 5.A: Wiring Details, Aquacell S50 Sampler	5.3
Figure 5.B: Wiring Details, Aquacell S100 Sampler	5.6
Figure 5.C: Wiring Details, Aquacell S200 Sampler	5.9
Figure 5.D: Wiring Details, Aquacell S300 Series Samplers	5.12
Figure 6.A: Front Panel Controls of The Sampler Unit	6.3

AQUACELL S50/S100/S200/S300 SERIES WASTEWATER SAMPLER - NEW PRODUCT WARRANTY

WARRANTY

i

Thank you for choosing an Aquamatic Wastewater Sampler. The Sampler, when properly used and maintained, should give many years of reliable service. To mark our confidence in your new Aquamatic Sampler it comes with the following guarantee:

Electrical and/or mechanical defects occurring during the 12 months from the date of invoice will be rectified free of charge provided the defective item is returned carriage paid to the supplier during this 12 month warranty period.

Details of Breakdown Service can be found in the MAINTENANCE section of this User Guide (see page 7.8 for further information).

Please read this User Guide carefully, as neither Aquamatic Ltd., nor its agents accept responsibility for any damage or defect caused by misuse, abuse, neglect or incorrect operation.

Aquamatic Wastewater Samplers are subject to continuous development and improvement. Components and specifications may change without notice.

One copy of the User Guide is included with each Sampler. This is intended to assist the reader in the effective application of the product and although the information contained is given in good faith, Aquamatic Ltd., does not accept responsibility or liability for any loss or damage arising from the use of information provided or from information being omitted.

In any event Aquamatic Ltd., does not accept liability for any consequential loss or damage arising from the use or failure of the product or any information provided, including, but not limited to, economic or financial loss, damage to peripheral equipment or products, loss of use, productivity or time.

Discrepancies in Content of Consignment / Damage in Transit

On receipt of the consignment it is important to check the following:

- That the consignment matches the supplier's delivery note, and in turn the items specified on your purchase order. See CONTENTS OF PACKAGE page 1.1 for details.
- That no transit damage has occurred.

It is important to report any discrepancies or transit damage within 48 hours, otherwise transit insurance may be invalidated. In any event the cost of rectification would not be covered under the product warranty.

Note: (S200/S300 Series) The packaging material protecting the Sampler can be removed for inspection purposes (temporarily if appropriate) without the need to remove the Sampler from its palette.

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Storage of the Sampler Prior to Installation

The Sampler should be kept in a dry indoor storage area until it is ready to be installed.

1

CONTENTS OF PACKAGE

The following is an illustrated list of most of the items appearing on the price list. This is a usefull means of identifying the items ordered, in order to ensure your order has been executed correctly.

Some price list items are omitted as they are fully integrated and not able to be depicted visually. Price list items are also omitted, when an illustration serves no useful purpose.

CONTENTS
OF
PACKAGE

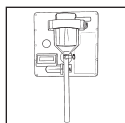
1.1

Samplers - S50

Aquacell S50 Wastewater Sampler
Part Number CL-1210-*voltage*

CONTENTS
OF
PACKAGE

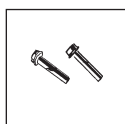
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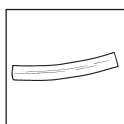
Aquacell S50
Sampler Unit



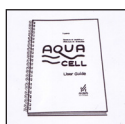
Intake Hose Clip^[1]
(S50)



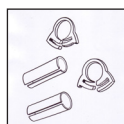
2 Anchor bolts



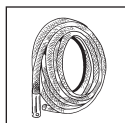
Spare Volume
Control Tube



User Guide



2 Intake Hose
Anchors^[1]



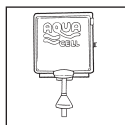
Intake Hose with filter
(5 metres long)^[1]

[1] not included when PPI is specified

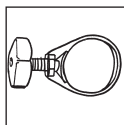
Samplers - S100

Aquacell S100 Wastewater sampler

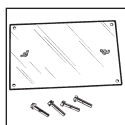
Part Number: CL-1220-voltage



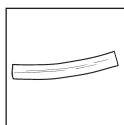
Aquacell S100
Sampler Unit



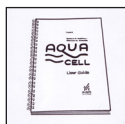
Intake Hose Clip^[1]



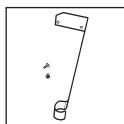
Wall mounting plate
with
4 Anchor bolts



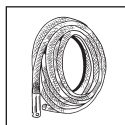
Spare Volume
Control Tube



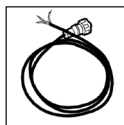
User Guide



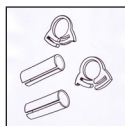
Strain relief bracket
with 2 fixing
screws^[1]



Intake Hose with
filter (10 metres
long)^[1]



Mains supply cable



2 Intake Hose
Anchors^[1]

CONTENTS
OF
PACKAGE

1.3

[1] not included when PPI is specified

Samplers - S200

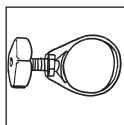
Aquacell S200 Wastewater Sampler
Part Number CL-1230-*voltage*

CONTENTS
OF
PACKAGE

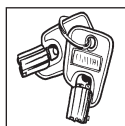
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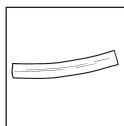
Aquacell S200
Sampler Unit



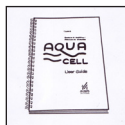
Intake Hose Clip^[1]



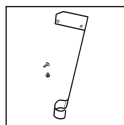
Fridge Keys



Spare Volume
Control Tube



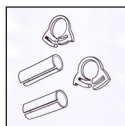
User Guide



Strain relief bracket
with 2 fixing
screws^[1]



Intake Hose with
filter (10 metres
long)^[1]



2 Intake Hose
Anchors^[1]

[1] not included when PPI is specified

Samplers - S310 / S320

Aquacell S310 Wastewater Sampler
Part Number CL-1240-*voltage*

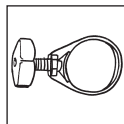
Aquacell S320 Wastewater Sampler
Part Number CL-1260-*voltage*

CONTENTS
OF
PACKAGE

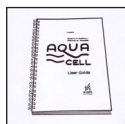
1.5



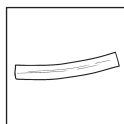
Aquacell S310/S320
Sampler Unit



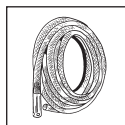
Intake Hose Clip^[1]



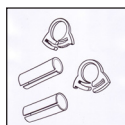
User Guide



Spare Volume
Control Tube



Intake Hose with
filter (10 metres
long)^[1]



2 Intake Hose
Anchors^[1]

Note: The Sampler's lower compartment is used to transport the Sample Collection Vessel, ancillaries, etc...

[1] not included when PPI is specified

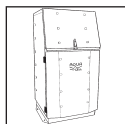
Samplers - S310H/S320H

Aquacell S310H Wastewater Sampler
Part Number CL-1250-*voltage*

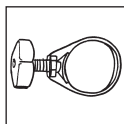
Aquacell S320H Wastewater Sampler
Part Number CL-1270-*voltage*

CONTENTS
OF
PACKAGE

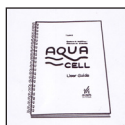
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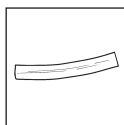
Aquacell S310H/
S320H Sampler Unit



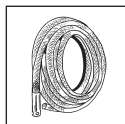
Intake Hose Clip^[1]



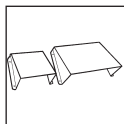
User Guide



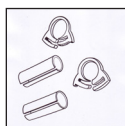
Spare Volume
Control Tube



Intake Hose with
filter (10 metres
long)^[1]



Air Cowls (including
9, M4 fixing screws/
nylon washers)



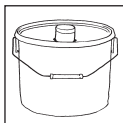
2 Intake Hose
Anchors^[1]

Note: The Sampler's lower compartment is used to transport the Sample Collection Vessel, ancillaries, etc...

[1] not included when PPI is specified

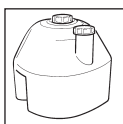
Sample Collection Vessels (SCV's)

Single Container Options



10 Litre Polypropylene
Container

Part Number CL-3005



25 Litre Polyethylene
Container

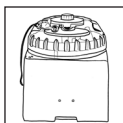
Part Number CL-3001

CONTENTS
OF
PACKAGE

1.7

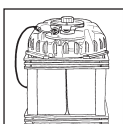
Bottler Options

Removable Bottlers



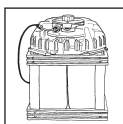
2 x 4.5 Litre Self-Emptying
Polypropylene
Bottler (including expansion
coupling)

Part Number CL-3006



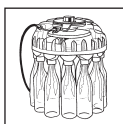
4 x 4.5 Litre Glass Bottler

Part Number CL-3007



4 x 5 Litre HDPE Bottler

Part Number CL-3008

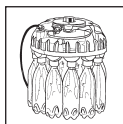


12 x 0.75 Litre Glass Bottler

Part Number CL-3002

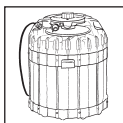


Integral Bottlers



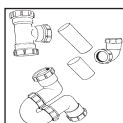
12 x 1 Litre PET Bottler

Part Number CL-3003



24 x 1 Litre HDPE Bottler

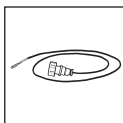
Part Number CL-3004



2 x 4.5 Litre Self-Emptying
Polypropylene Integral
Bottler (plus additional
integral parts)

Part Number CL-3108

Optional Equipment - Electrical



Ancillary Signal Connection,
Basic (plus additional
integral parts)

Part Number CL-4004



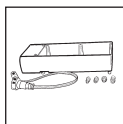
Back-up Battery / Float
Charger (plus additional
integral parts)

Part Number CL-4024



Beacon
(plus additional Integral
parts)

Part Number CL-4122



Condensate Evaporator
Tray
(plus additional integral
parts)

Part Number CL-4112
-voltage

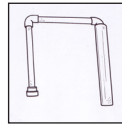


Pressurised Pipeline Interface
- Standard

Part Number CL-4147-voltage



PPI Unit



Pipe Extension
Assembly



4 Anchor bolts



Intake Hose Clip
(PPI)



Intake Hose (10
metres long)



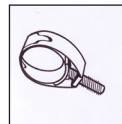
2 PPI Housing Door
Keys

Pressurised Pipeline Interface
- S300

Part Number CL-4120-voltage



Intake Hose (10
metres long)



Intake Hose Clip
(PPI)



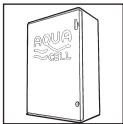
2 PPI Housing Door
Keys



Optional Equipment - Mechanical

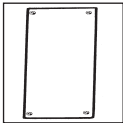
CONTENTS
OF
PACKAGE

1.10



Auxiliary Equipment
Enclosure (plus additional
integral parts)

Part Number CL-4117



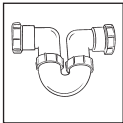
Auxiliary Equipment
Mounting Plate

Part Number CL-4108



Intake Hose Support
Bracket Kit

Part Number CL-4010



Wastewater Drain (plus
additional integral parts)

Part Number CL-4102

Consumable Spares



Battery, Sampler

Part Number CL-6026



Desiccant Bag

Part Number CL-7009



Sample Chamber

Acrylic Part Number CL-6164

Glass Part Number CL-6028



2

INTRODUCTION

The Sampling Process

Aquacell Stationary Wastewater Samplers extract individual sample shots from an open (non pressurised) source, such as a wastewater channel or vessel, according to a predetermined program and deposit them into one or more Sample Collection Vessels (SCVs). In this way the user is provided with a representative sample of the wastewater discharge.

Each of the Aquacell Samplers is capable of being combined with a Pressurised Pipeline Interface (PPI), to give the Sampler the capability of sampling from a Pressurised Sampling Point (Typically a pipeline, operating at pressures up to 6 Bar)

The S200, S320 and S320H Samplers incorporate sample temperature control. This is particularly important for biologically active wastewater. The Sample Collection Vessel is contained within the temperature controlled, lockable lower compartment of the Sampler. Samples are stored at an average temperature, between 0°C and 5°C, to minimise degradation during the storage period between sample extraction and analysis.

The refrigerated housing is automatically defrosted.

The way in which samples are used will vary from application to application. For example, samples can be:

- Analysed using in-house laboratory facilities – when the objective of taking samples is to gain a greater knowledge of the discharge profile with a view to:
 - a) Reducing the pollution load of the discharge (to meet consent conditions – for example).
 - b) Reducing water company effluent charges.
 - c) Reducing product wastage.

- Sent to a specialist analytical laboratory for analysis - when an independent assessment of the discharge is required.
- Made available, to the water company receiving and treating the wastewater, as a source of data on which to base charges. (Self-monitoring is being increasingly encouraged by water companies both in the interests of accurate charging and to encourage dischargers to improve plant efficiency, and so reduce the pollution load of their discharge.)

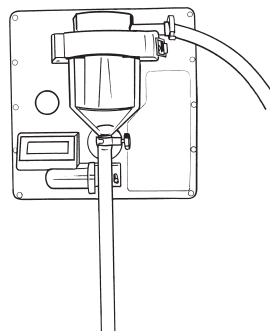
Aquacell S50/S100/S200/S300(Series) Samplers

Aquacell S50 Wastewater Sampler

This is a wall mounting automatic sampler, featuring the Aquacell Sampler Module. The Aquacell S50 is intended for indoor applications only.

The Sampler is supplied with a Bracket / Mounting Bolts to facilitate attachment to a wall or similar flat vertical surface.

When the Sampler is specified with a 10 litre Polyethylene Container, an optional Suspension Bracket is available which attaches to the lower edge of the Sampler Module, and provides a suspension point for the Container.



All other Detachable Sample Collection Vessels can be used with the S50 where the installation provides for the SCV to be located suitably beneath the Sampler.

Whilst the Sampler is suitable for operation at ambient temperatures between -10°C and +50°C, frost protection for the sample is not provided.

Aquacell S100 Wastewater Sampler

This is a wall mounting automatic sampler, featuring the Aquacell Sampler Module. The Aquacell S100 is intended for either indoor or outdoor applications.

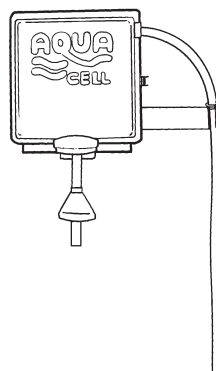
The Sampler is supplied with a Bracket / Wall Mounting Plate / Mounting Bolts to facilitate attachment to a wall or similar vertical surface.

Lockable covers are provided to prevent access to the sampler's operational components and Battery Compartment

When the Sampler is specified with a 10 litre Polyethylene Container, an optional Suspension Bracket is available which attaches to the lower edge of the Sampler Module, and provides a suspension point for the Container.

All other Removable Sample Collection Vessels can be used with the S50 where the installation provides for the SCV to be located suitably beneath the Sampler.

Whilst the Sampler is suitable for operation at ambient temperatures between -10°C and $+50^{\circ}\text{C}$, frost protection for the sample is not provided.

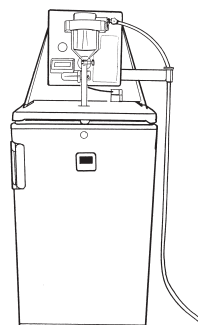


Aquacell S200 Wastewater Sampler

This is a floor standing automatic Sampler, featuring the Aquacell Sampler Module, and incorporating sample refrigeration. The Sampler Module is mounted above the metal Sample Container Housing. The Aquacell S200 is intended for heated indoor applications only.

The door to the temperature controlled sample container housing is lockable.

The sampler can be used with all of the Removable Sample Collection Vessels, except the 2 x 4.5 litre Self-Emptying Polypropylene Bottler.



The sampler is suitable for operation at ambient temperatures between +5°C and +40°C.

Aquacell S300 Series Wastewater Samplers

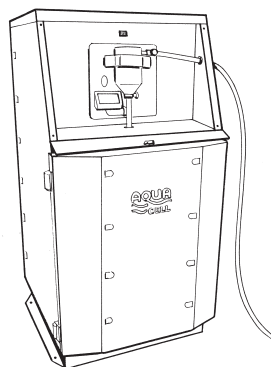
A range of floor mounted automatic samplers, based on a metal cabinet, featuring the Aquacell Sampler Module. The Sampler Module is panel mounted in the upper section of the cabinet. The lower section of the cabinet is the Sample Container Housing.

The Sample Container Housing is highly insulating and has a lockable front door.

The Aquacell S300 Series comprises four primary variants as follows:

Aquacell S310 Wastewater Sampler

This sampler is intended for mainly indoor applications. It does not have Sample Temperature Control. The Sampler module is fully accessible. The sampler is suitable for operation at ambient temperatures between +5°C and +50°C.

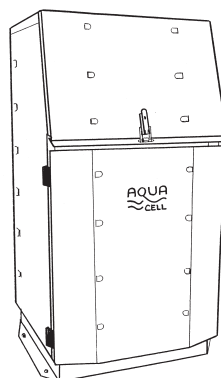


Aquacell S320 Wastewater Sampler

This sampler is intended for mainly indoor applications. It has full Sample Temperature Control. The Sampler module is fully accessible. The sampler is suitable for operation at ambient temperatures between +5°C and +40°C.

Aquacell S310H Wastewater Sampler

This sampler is intended for mainly outdoor applications. Although not having full Sample Temperature Control, this sampler does have Sample Frost Protection. The upper section of the Cabinet is fully enclosed by a lockable Lift-Up Protection Cover. The sampler is suitable for operation at ambient temperatures between -10°C and +50°C.



Aquacell S320H Wastewater Sampler

This sampler is intended for mainly outdoor applications. It has full Sample Temperature Control. The upper section of the Cabinet is fully enclosed by a lockable Lift-Up Protection Cover. The sampler is suitable for operation at ambient temperatures between -10°C and +50°C.

The Pressurised Pipeline Interface (PPI)

This is an equipment which either stands along-side the Sampler (PPI - Standard Version, specified for use with S50, S100 and S200 Samplers), or is integral to the Sampler (PPI - S300 Version used with S300 Series Samplers). The PPI is an interface between the Sampler and a pressurised Sampling Point. It gives the Sampler the ability to extract representative samples from pipelines at pressures up to 6 bar.

The PPI - Standard is wall mounted and is supplied with mounting bolts to facilitate attachment to a wall or similar vertical surface.

The PPI - S300 Version is fully integrated with the Sampler cabinet.

The PPI is suitable for operation at ambient temperatures between -10°C and +50° (when the optional Anti-Condensation Heater is fitted).

Wastewater Drain

All S300 series samplers can be specified with a Wastewater Drain.

When a Sampler is supplied with a Wastewater Drain, the lower compartment of the Sampler provides a useful discharge point for surplus samples, accidental spillage etc.

When a Sampler is specified with a Self-Emptying Bottler, a Wastewater Drain is included.

Samplers incorporating a Wastewater Drain are supplied with a “P” Trap (To accommodate the “P” Trap, the Sampler is fitted with a special deep Cabinet Base, which raises the overall height of the Sampler by 140mm). The purpose of the water trap is to prevent cold air leaking from the Sampler’s Lower Compartment and adversely affecting temperature control (S320 & S320H only). It also provides a screen against intrusion from insects etc.

Condensate Drain (S320 & S320H only)

A Condensate Drain is incorporated in S320 and S320H samplers (Samplers with sample temperature control) unless a wastewater drain is specified. The Condensate Drain outlet discharges the small volume of condensate water produced by the refrigeration system in the Samplers Lower Compartment. The Condensate Drain incorporates a water trap within the Base of the Sampler Cabinet, to prevent cold air leaking from the Sampler's Lower Compartment and adversely effecting temperature control. It also provides a screen against intrusion from insects, etc. When a Wastewater Drain is specified, it replaces the Condensate Drain.

The User Guide

The User Guide has been written to accommodate the complete Aquacell S50/S100/S200/S300 product range. Much of the information supplied applies equally to all formats, however, where information relates to a specific format, collection vessel or ancillary then it is given under a separate heading so the reader can readily focus on information relating to his particular Sampler.

The Aquacell S50/S100/S200/S300 sampling system is designed for ease of operation and maintenance. If you follow the instructions given in this guide you should quickly be able to benefit from the availability of truly representative wastewater samples.

Safety First

Infection

Aquacell S50/S100/S200/S300 Wastewater Samplers and Sample Collection Vessels have been designed to minimise the risk of operator contact with the potentially hazardous wastewater medium, however great care should always be exercised when working in close proximity to wastewater. Particular attention should be paid to the following points:

1. Wash hands thoroughly after handling contaminated Sampler parts.
2. Do not allow wastewater to come into contact with any open wounds or skin abrasions.
3. If any Glass has become cracked or chipped replace immediately to avoid the risk of cuts.

Electrical

Aquacell S50/S100/S200/S300 Wastewater Samplers are powered by an AC mains supply. As all mains voltage terminals are safely housed behind protective covers then contact with dangerous voltages is avoided.

Mechanical

Care should be taken, whilst the Sampler is in operation, to avoid trapping fingers in the pinch valve assembly.

The Sampler may (if ordered) have a Glass Sample Chamber and/or Glass Sample Collection Vessels, so do take great care when handling as these can be very slippery when wet.

Caution: Do not attempt to carry out any maintenance on the sampler other than that described in the Maintenance Section of this User Guide.



INTRODUCTION

2.8



3

CHOOSING A SITE

- The Sampler should not be situated in a classified hazardous area.
- The Sampler should be installed as close to the Sampling Point as possible to minimise the potential for cross-contamination between successive samples.

Environmental Considerations

See Technical Specification (page 8.8), for IP Rating and Ambient Temperature Range.

- ✓ S50 and S200 Samplers are only suitable for indoor sites.
- ✓ S310 and S320 Samplers are mainly intended for indoor sites.
- ✓ S100, S310H and S320H Samplers are suitable for indoor / outdoor sites
- ✓ The Pressurised Pipeline Interface is suitable for outdoor use provided the Anti-Condensation Heater is specified, however as liquid remains in the Intake hose (The hose connecting the Pipeline Tapping Point to the PPI) between samples, trace heating of this hose will be necessary, if freezing ambient temperatures are likely to be encountered.
- ✓ When choosing a site, consideration should be given to the possibility, that solar radiation could cause the Sampler to rise above its specified maximum temperature. If this possibility exists, then solar screening should be provided.

CHOOSING A
SITE

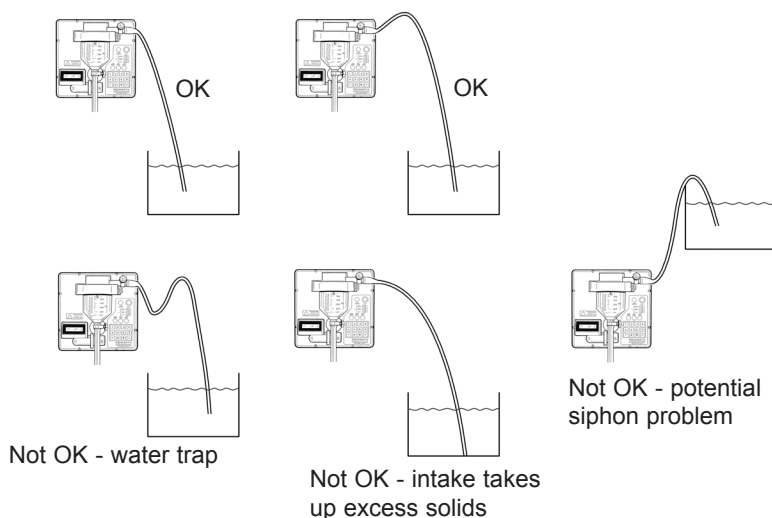
3.1

Non-pressurised Sampling Points

S50 / S100 / S200 / S300(Series) Samplers are all suitable for use with Non-pressurised Sampling Points unless specified with the Pressurised Pipeline Interface. The criteria to consider when using a sampler to sample from a non-pressurised Sampling Point are as follows:

- The Sampler's Intake Hose should be installed so that it is self-draining. A single high point is permitted (such as a channel wall), as the sample tract is open between samples. See Figure 3.A below.
- Choose a Sampling Point where you can be sure that the wastewater is well mixed – downstream of a measuring flume is ideal.

Figure 3.A: Intake Hose Geometry



- The Sample Intake Level should be above the top water level of the stream from which the samples are to be taken. This avoids the possibility of siphoning – See Figure 3.A above. Also see the Sampler Installation Drawing of the Sampler specified, in PREPARING THE SITE (Section 4), for details of the Sample Intake Level.
- If the Sampler is to be operated with a 2 x 4.5 Litre Self-Emptying Bottler or a Wastewater Drain has been specified (S300 Series Samplers, only), a Gravity Drain will be necessary to dispose of unwanted wastewater to a suitable disposal point (Often back to the vicinity of the Sampling Point).

- S320 and S320H Samplers, only - These samplers feature sample refrigeration and need to dispose of a small volume of condensate water. Samplers fitted with a Wastewater Drain are able to dispose of Condensate Water. Samplers not fitted with a Wastewater Drain, have a Condensate Water Drain. There are 3 alternative methods of disposal of water discharging from the Condensate Water Drain, which are as follows:
 - Construct a Gravity Drain from 21.5mm O/D plastic pipe.
 - Deploy a Condensate Evaporator Tray (Part Number CL-4112). (Note – This should have been specified with the Sampler order as it cannot be retro-fitted).
 - (Outdoor Installations) Simply allow the condensate water to soak away into the surrounding earth.

Pressurised Sampling Points

Samplers specified with the Pressurised Pipeline Interface (PPI) are suitable for sampling from pressurised Sampling Points (typically pipelines). Considerations when using a sampler to sample from a pressurised Sampling Point are as follows:

- The Sampler / PPI can be positioned above or below the Sampling Point as required
- The Intake Hose routing is non-critical.
- Choose a Sampling Point where you can be sure that the wastewater is well mixed and a representative sample will always be available.
 - If there is likely to be any sediment at the bottom of the pipe then it may be preferable to tap into the side of the pipe.
 - If the pipeline is not always full then a tapping point below minimum liquid level should be chosen.
- Minimum Pipeline Tapping Point Pressure - The pressure in the pipeline at the tapping point must always be sufficient to create a flow of 0.5m/s in the Ø12mm bore Intake Hose. Consideration should be given to the hydro-static head created by the relative height of the Sampling Point with the Flush Discharge Level of the PPI. See the PPI installation drawing, page 4.20 or page 4.22 for details. A Sampling Point above the Flush Discharge Level of the PPI will add to the pipeline pressure and a Sampling Point below the Flush Discharge Level of the PPI will subtract from the pipeline pressure.

- Maximum Pipeline Tapping Point Pressure - The maximum permissible pipeline pressure is 6 Bar.
- A Gravity Drain will be necessary to dispose of unwanted wastewater from the PPI to a suitable disposal point.
- If the Sampler is to be operated with a 2 x 4.5 Litre Self-Emptying Bottler or a Wastewater Drain has been specified (S300 Series Samplers, only), an additional Gravity Drain will be necessary to dispose of unwanted wastewater to a suitable disposal point^[1].
- S320 and S320H Samplers, only - These samplers feature sample refrigeration and need to dispose of a small volume of condensate water. Samplers fitted with a Wastewater Drain are able to dispose of Condensate Water. Samplers not fitted with a Wastewater Drain, have a Condensate Water Drain. There are 3 alternative methods of disposal of water discharging from the Condensate Water Drain, which are as follows:
 - Construct an additional Gravity Drain from 21.5mm O/D plastic pipe^[1]
 - Deploy a Condensate Evaporator Tray (Part Number CL-4112). (Note – This should have been specified with the Sampler order as it cannot be retro-fitted).
 - (Outdoor Installations) Simply allow the condensate water to soak away into the surrounding earth.

[1] It may be possible to use the PPI drain for this purpose

4

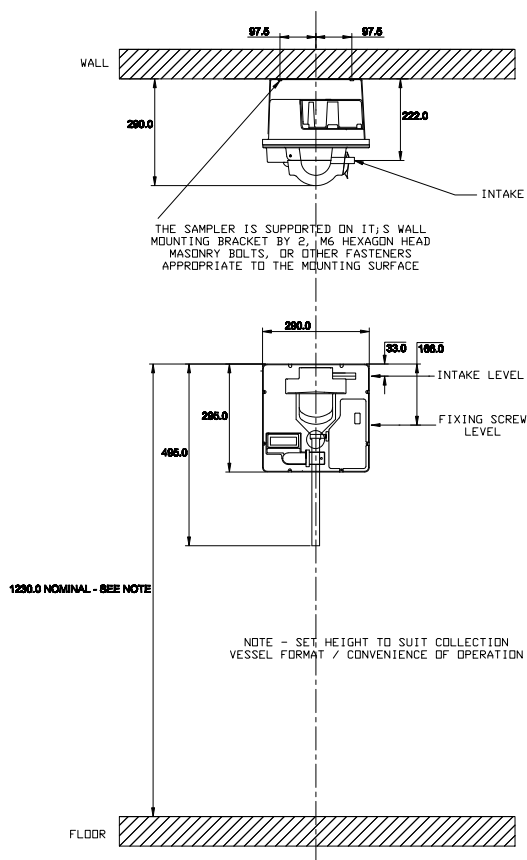
PREPARING THE SITE

Aquacell S50 Sampler

First remove all packing material from the Sampler and its Ancillaries

Figure 4.A: Installation Drawing, S50 Sampler

All dimensions are in mm.





Sampler / Sample Collection Vessel Location

A wall or similar flat surface is required, on which to mount the Sampler. The Sampler should be positioned above the Sample Collection Vessel (SCV) such that the Samplers Pinch Valve Tube, is able to engage the inlet of the SCV to a depth of 60mm. The Sampler / SCV should be positioned at a convenient height for operator access. A nominal dimension of 1230mm is suggested, for the height of the top edge of the Sampler above the floor. A shelf may need to be provided for the SCV.

If the Sampler is to be used with a 2 x 4.5 Litre Self-Emptying Bottler, then a pair of Guide Rails for the Bottler, fitted to the Bottler Support Shelf, may be useful in ensuring that the Bottler Drain Spigot engages readily with the Expansion Coupling / Gravity Drain, when the Bottler is slid into position.

Gravity Drain (Wastewater) Installation (if required)

Construct the drain from 56mm O/D, 50mm I/D plastic pipe.

An expansion coupling is provided with the Bottler, which has a solvent weld joint at one end and a chevron seal at the other.

Terminate the drainpipe by solvent welding the pipe end to the expansion coupling. The expansion coupling should be rigidly supported (possibly by the drainpipe connecting to it) such that the chevron seal aligns with the Drain Spigot at the base of the rear face of the Bottle Carrier, when the Bottler is in position beneath the Sampler. The rubber chevron seal provides a removable coupling for the Bottler

Electrical Power Supply Installation

A suitable electrical supply should be provided for the Sampler - See TECHNICAL SPECIFICATION (page 8.8) which is terminated in a switched fused Isolator, mounted adjacent to the Sampler.

A 1.8 metre Power Cable is provided which emanates from the bottom rear of the Sampler Module. This cable should be connected to a suitable Switched, Fused Isolator.



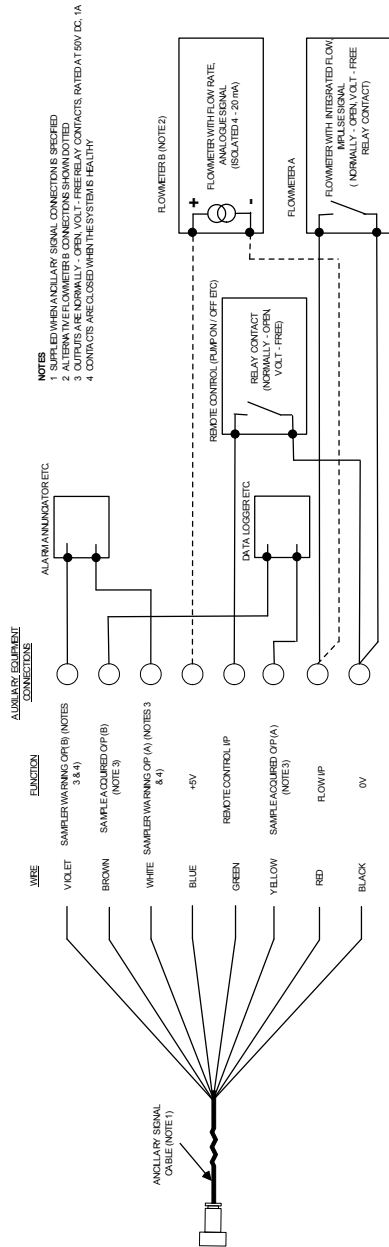
(Optional) Ancillary Signal Connection

See Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S50 Sampler (page 4.4). Auxiliary Equipment should, if possible, be positioned adjacent to where it is intended to mount the Sampler, within reach of the Samplers Ancillary Signals Cable.

Cables to / from the Auxiliary Equipment may need to be terminated in one or more Signal Isolators (Not supplied by Aquamatic) mounted adjacent to the Sampler. The isolators should be connected to the Sampler via the Samplers Ancillary Signals Cable.

Isolators are necessary to protect the Samplers inputs / outputs from damaging electrical transients, which are sometimes induced in long cables.

Figure 4.B: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S50 Sampler



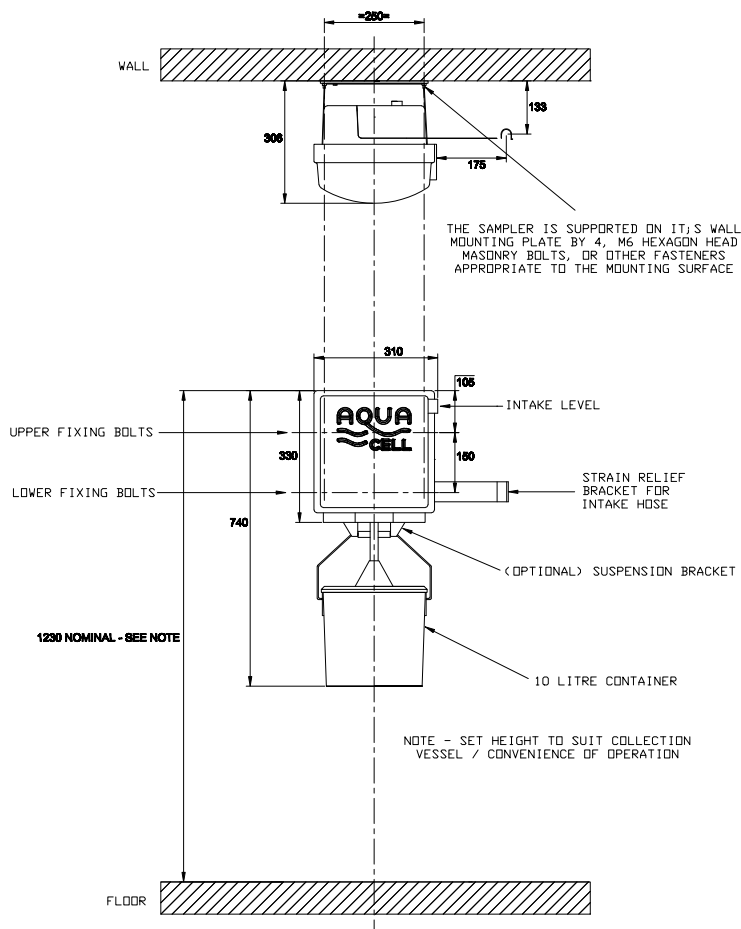
Aquacell S100 Sampler

First remove all packing material from the Sampler and its Ancillaries

Figure 4.C: Installation Drawing, S100 Sampler

Notes:

- All dimensions are in mm.
- Shown with a 10 Litre Container and (optional) Suspension Bracket.





Sampler / Sample Collection Vessel Location

A wall or similar flat surface is required, on which to mount the Sampler. The Sampler should be positioned above the Sample Collection Vessel (SCV) such that the Samplers Pinch Valve Tube, is able to engage the inlet of the SCV to a depth of 60mm. The Sampler / SCV should be positioned at a convenient height for operator access. A nominal dimension of 1230mm is suggested, for the height of the top edge of the Sampler above the floor. A shelf may need to be provided for the SCV.

If the Sampler is to be used with a 2 x 4.5 Litre Self-Emptying Bottler, then a pair of Guide Rails for the Bottler, fitted to the Bottler Support Shelf, may be useful in ensuring that the Bottler Drain Spigot engages readily with the Expansion Coupling / Gravity Drain, when the Bottler is slid into position.

Gravity Drain (Wastewater) Installation (if required)

Construct the drain from 56mm O/D, 50mm I/D plastic pipe.

An expansion coupling is provided with the Bottler, which has a solvent weld joint at one end and a chevron seal at the other.

Terminate the drainpipe by solvent welding the pipe end to the expansion coupling. The expansion coupling should be rigidly supported (possibly by the drainpipe connecting to it) such that the chevron seal aligns with the Drain Spigot at the base of the rear face of the Bottle Carrier, when the Bottler is in position beneath the Sampler. The rubber chevron seal provides a removable coupling for the Bottler

Electrical Power Supply Installation

A suitable electrical supply should be provided for the Sampler - See TECHNICAL SPECIFICATION, (page 8.8), which is terminated in a switched fused Isolator, mounted adjacent to the Sampler.

A 1.8 metre Power Cable is provided which connects to the bottom rear of the Sampler Module. This cable should be connected to the isolator.



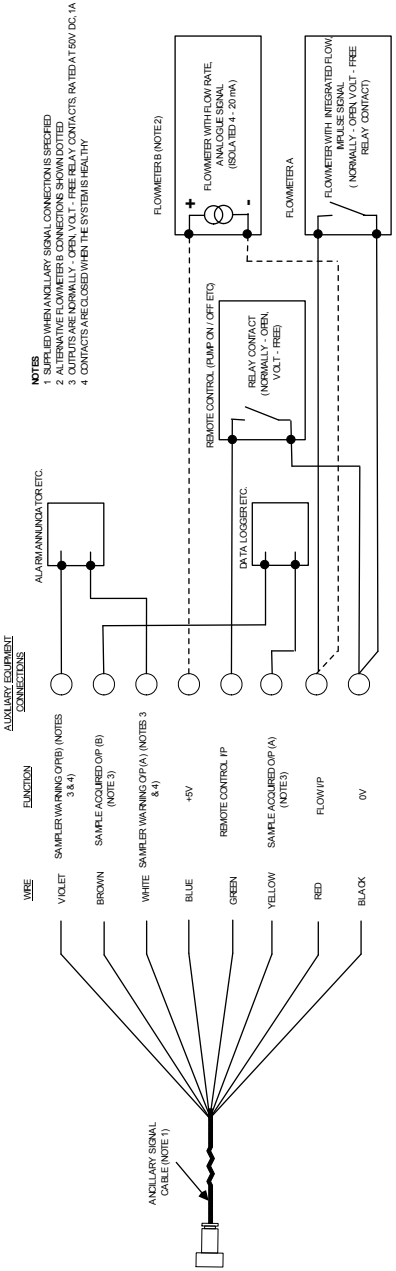
(Optional) Ancillary Signal Connection

See Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S100 Sampler (page 4.8). Auxiliary Equipment should, if possible, be positioned adjacent to where it is intended to mount the Sampler, within reach of the Samplers Ancillary Signals Cable.

Cables to / from the Auxiliary Equipment may need to be terminated in one or more Signal Isolators (Not supplied by Aquamatic) mounted adjacent to the Sampler. The isolators should be connected to the Sampler via the Samplers Ancillary Signals Cable.

Isolators are necessary to protect the Samplers inputs / outputs from damaging electrical transients, which are sometimes induced in long cables.

Figure 4.D: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S100 Sampler



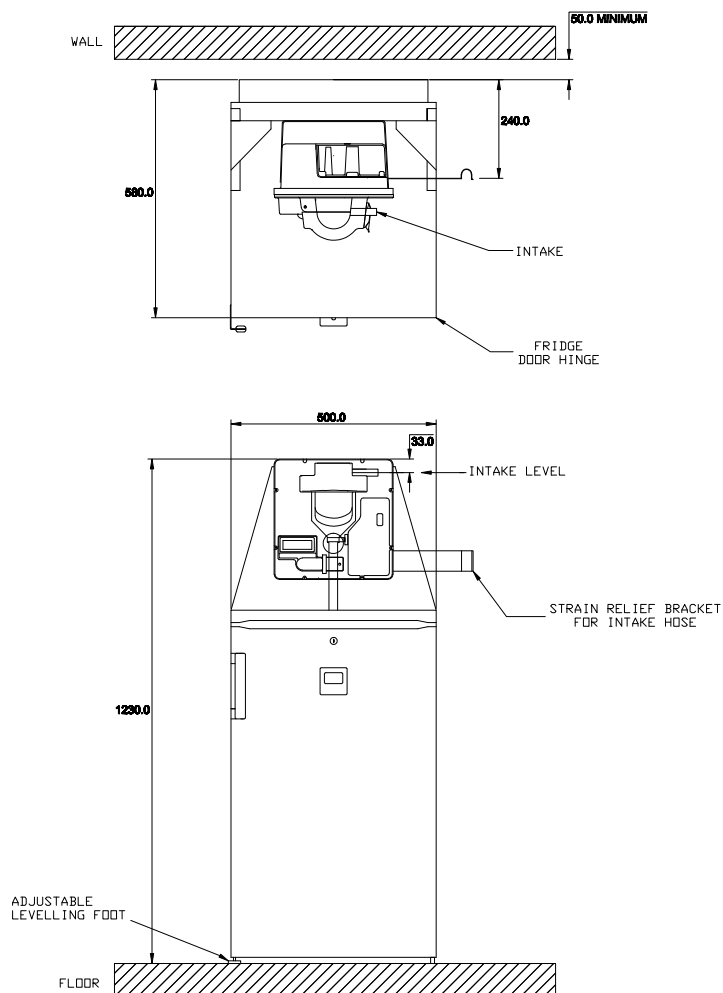
Aquacell S200 Sampler

First remove all packing material from the Sampler and its Ancillaries except for the wooden palette on which the Sampler stands.

Figure 4.E: Installation Drawing, S200 Sampler

Notes:

- The Samplers Lower Compartment is used to transport the Sample Collection Vessel, ancillaries etc.
- All dimensions are in mm.





Sampler Location

A flat horizontal floor in a dry heated building is required to free-stand the Sampler. Front access is required, to be able to operate the Sampler and to retrieve the samples.

Electrical Power Supply Installation

A suitable electrical power supply should be provided for the Sampler – See TECHNICAL SPECIFICATION, (page 8.8), which is terminated in a switched, fused isolator, mounted adjacent to the Sampler.

The Sampler is provided with a 1.5 metre Power Cable. This cable should be connected to the isolator.

(Optional) Ancillary Signal Connection

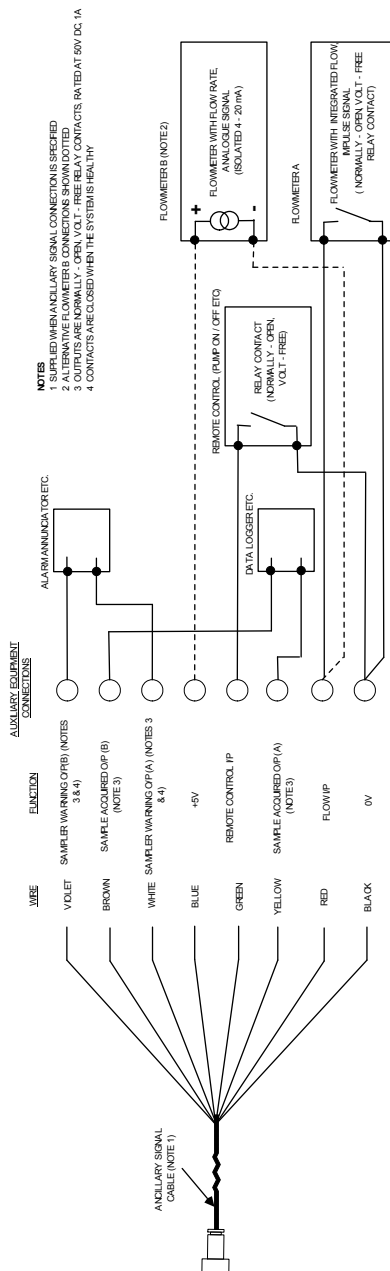
See Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S200 Sampler (page 4.11). Auxiliary Equipment should, if possible, be positioned adjacent to where it is intended to mount the Sampler, within reach of the Samplers Ancillary Signals Cable.

If it isn't possible to mount the Auxiliary Equipment adjacent to the Sampler, then the cables to / from the Auxiliary Equipment should be terminated in one or more Signal Isolators (not supplied by Aquamatic) mounted adjacent to the Sampler. The isolators should be connected to the Sampler via the Samplers Ancillary Signals Cable.

Isolators are necessary to protect the Samplers inputs / outputs from damaging electrical transients, which are sometimes induced in long cables.



Figure 4.F: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S200 Sampler



Aquacell S300 Series Samplers

First remove all packing material from the Sampler and it's ancillaries except for the wooden palette on which the Sampler stands. Note: The Sampler's Lower Compartment is used to transport the Sample Collection Vessel, ancillaries etc.

Figure 4.G: Installation Drawing, S300 Series Sampler - Top, Left Side and Front Views

All dimensions are in mm.

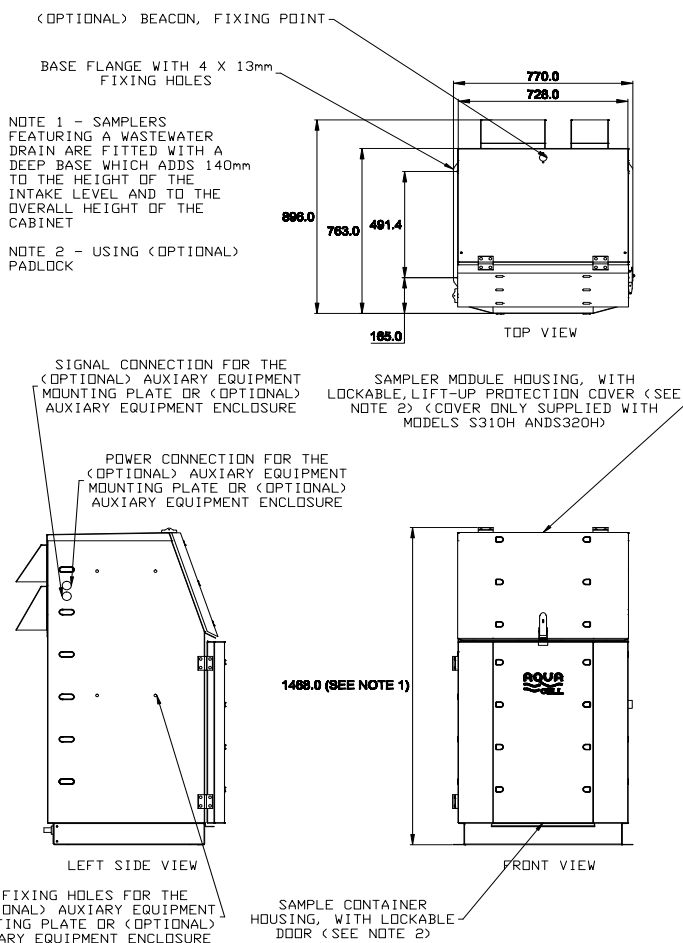
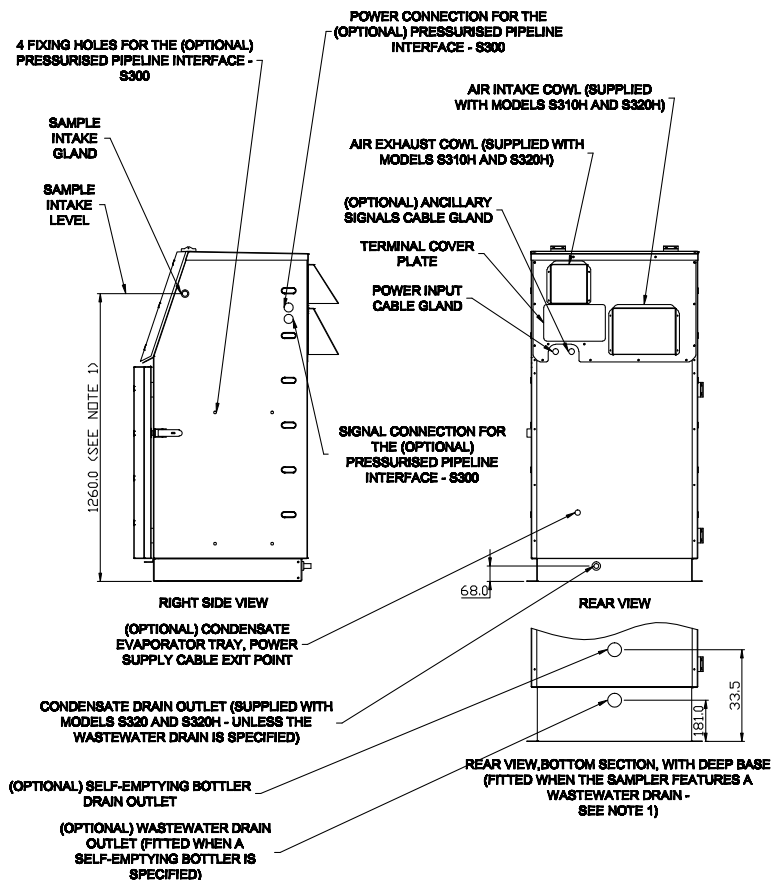


Figure 4.H: Installation Drawing, S300 Series Sampler - Right Side and Rear Views

All dimensions are in mm.





Sampler Location

A flat, horizontal mounting base (typically a 100mm thick concrete pad) should be provided for the Sampler, preferably with a standing area in front and service access to the rear.

Gravity Drain (Condensate) Installation (if required)

Construct the drain from 21.5mm O/D plastic pipe.

It is important when configuring the drain to avoid the possibility of water being removed from the trap by siphon action.

The Sampler is provided with a 21.5mm O/D stub pipe at the bottom rear of the Sampler Cabinet. The drain-pipe is joined to the stub pipe using a suitable fitting.

(Optional) Condensate Evaporator Tray Installation

Attach the 4 Thermal Isolation Springs to the feet of the tray. The springs are quite a tight force fit. The tray gets too hot to touch and the Thermal Isolation Springs serve to isolate the hot under-surface of the tray from the floor that it stands on.

The tray stands on the Mounting Base at the rear of the Sampler suitably positioned beneath the Condensate Drain Outlet Stub Pipe. In this way condensate is deposited into the tray and evaporated off into the atmosphere. The Condensate Evaporator Tray is only energised when the Sampler's Refrigeration Unit is operating (to minimise electricity consumption).

Gravity Drain (Wastewater) Installation (if required)

Construct the drain from 56mm O/D plastic pipe and terminate it in the P-Trap supplied with the Sampler (attach the drainpipe to the output of the P-Trap i.e. the lower connection point).

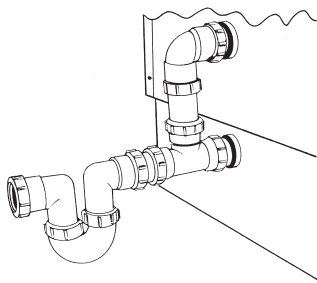
It is important when configuring the drain to avoid the possibility of water being removed from the trap by siphon action.

The Sampler is provided with a 56mm stub pipe at the bottom rear of the Sampler Cabinet. The P-Trap is attached to the Sampler at this point.



Gravity Drain for Self Emptying Bottler (if required)

Samplers specified with a 2 x 4.5 litre Self-emptying Integral Bottler are supplied with a Wastewater Drain. The bottler drain outlet and the Wastewater Drain outlet are connected to a P-Trap using the compression fittings supplied



Electrical Power Supply Installation

A suitable electrical supply should be provided for the Sampler - see TECHNICAL SPECIFICATION Page page 8.7, which is terminated in a switched fused isolator, fused according to the VA rating indicated on the Samplers Rating Label (beneath the cable glands on the lower rear panel of the Sampler Cabinet). The isolator should be mounted conveniently close to the Sampler's Power Input Cable Gland positioned at the rear of the Sampler.

Auxiliary Equipment Installation

Equipment can be mounted separately from the Sampler and connected to it via the "Optional Connections" Terminal Block mounted in the terminal enclosure at the rear of the Sampler, by specifying the (Optional) Ancillary Signal Connection.

Alternatively equipment can be mounted integrally to the Sampler by specifying either the (Optional) Auxiliary Equipment Plate, or the (Optional) Auxiliary Equipment Enclosure.

See page 4.18 Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S300 Series Samplers for application information.

(Optional) Ancillary Signal Connection

Auxiliary Equipment should, if possible, be positioned adjacent to the Sampler, such that the cable connecting between the Samplers Optional Connections Terminal Block, and the Auxiliary Equipment doesn't exceed 1.5 metres.



Cables to / from the Auxiliary Equipment may need to be terminated in one or more Signal Isolators (Not supplied by Aquamatic) mounted adjacent to the Sampler. The isolators should be connected to the Sampler via the Samplers Ancillary Signals Cable.

Isolators are necessary to protect the Samplers inputs / outputs from damaging electrical transients, which are sometimes induced in long cables.

(Optional) Auxiliary Equipment Mounting Plate

Caution: All equipment attached to the mounting plate (including junction boxes, terminal blocks etc.) must be suitably environmentally protected.

See page 4.19, Wiring Details - (Optional) Auxiliary Equipment Mounting Plate / (Optional) Auxiliary Equipment Enclosure

The Auxiliary Equipment Mounting Plate is made from stainless steel so any cutting tools used in the preparation of the plate must take this into account

Drill the mounting plate and attach the Auxiliary equipment as required.

Terminate the Mains Cable from the Auxiliary Equipment in the Auxiliary Power Connector provided

Terminate the Ancillary Signal Cable provided, in the Auxiliary Equipment as appropriate.

The Equipment should have 2 strain relieved flying leads coming from it, cut to a suitable length to connect to the mating connectors on the left hand side of the Sampler

(Optional) Auxiliary Equipment Enclosure

See page 4.19 Wiring Details - (Optional) Auxiliary Equipment Mounting Plate / (Optional) Auxiliary Equipment Enclosure

Open the enclosure using the key provided and remove the mounting plate

Drill the mounting plate and attach the Auxiliary equipment as required.

Replace the Mounting Plate in the enclosure



Thread the mains cable out through the top cable gland on the left-hand side of the enclosure and terminate it in the Auxiliary Power Connector provided.

Thread the Auxiliary Signals Cable in through the bottom cable gland on the left-hand side of the enclosure and couple it to the auxiliary equipment as required.

The Auxiliary Equipment Enclosure should have 2 strain relieved flying leads coming from it, cut to a suitable length to connect to the mating connectors on the left-hand side of the Sampler.

Figure 4.I: Connecting the Sampler to Typical Auxiliary Equipment, Aquacell S300 Series Samplers

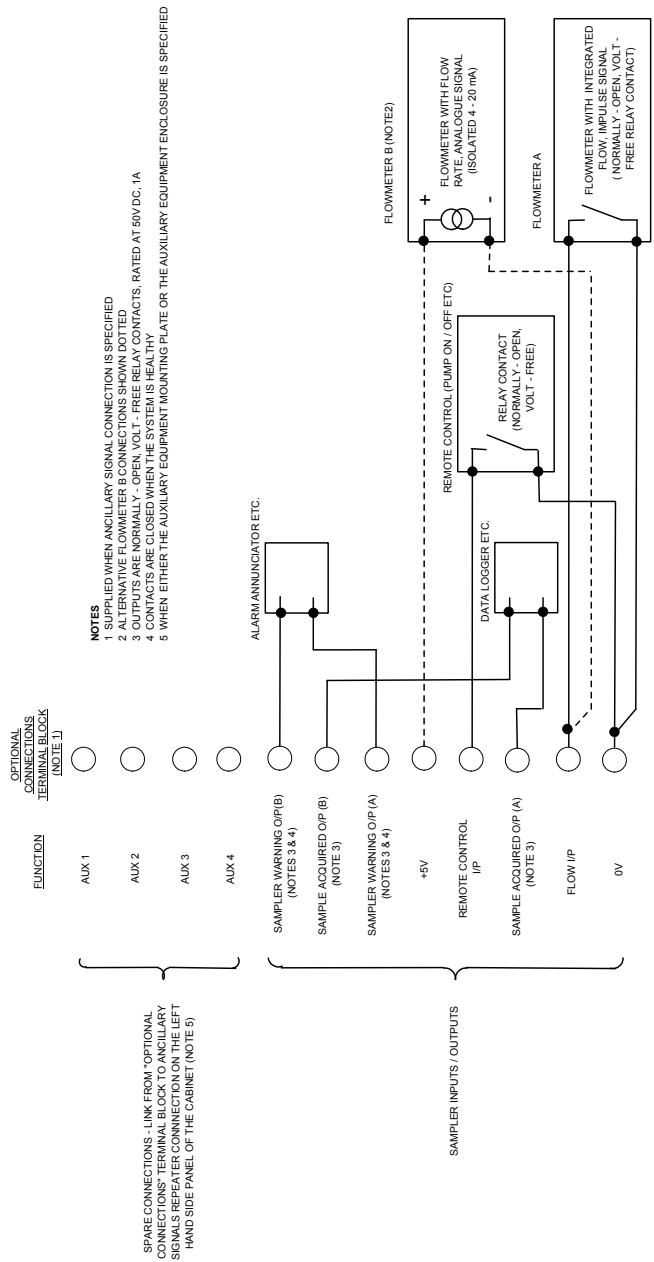
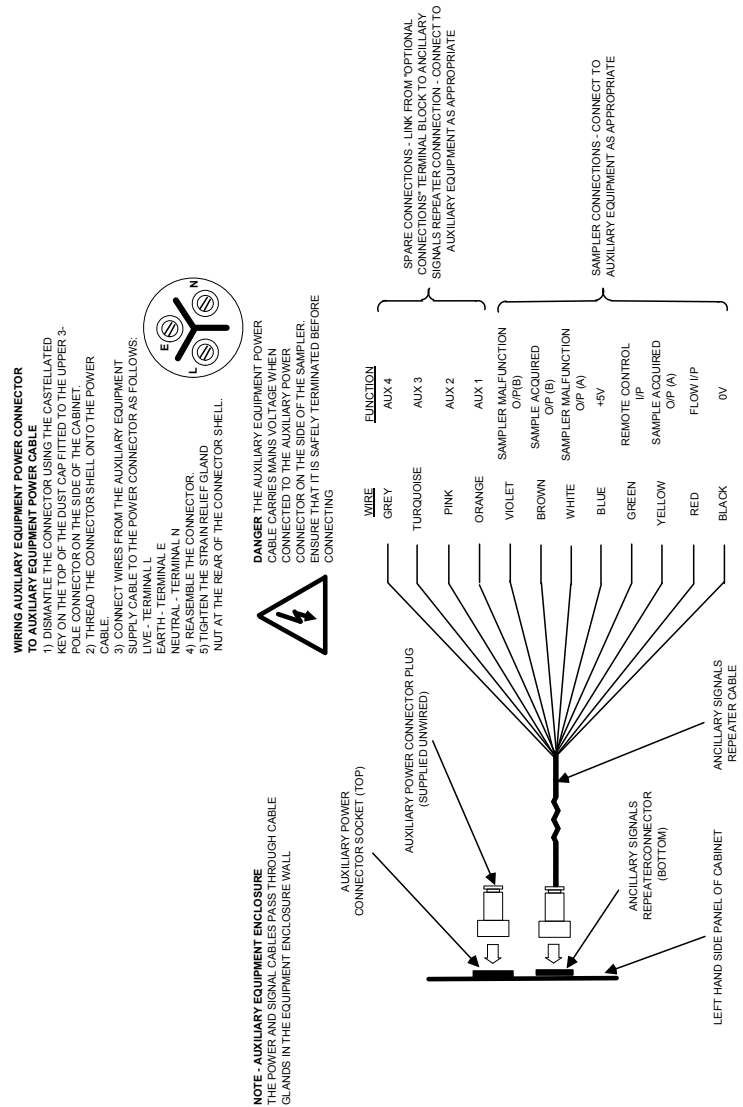


Figure 4.J: Wiring Details - (Optional) Auxiliary Equipment Mounting Plate/(Optional) Auxiliary Equipment Enclosure





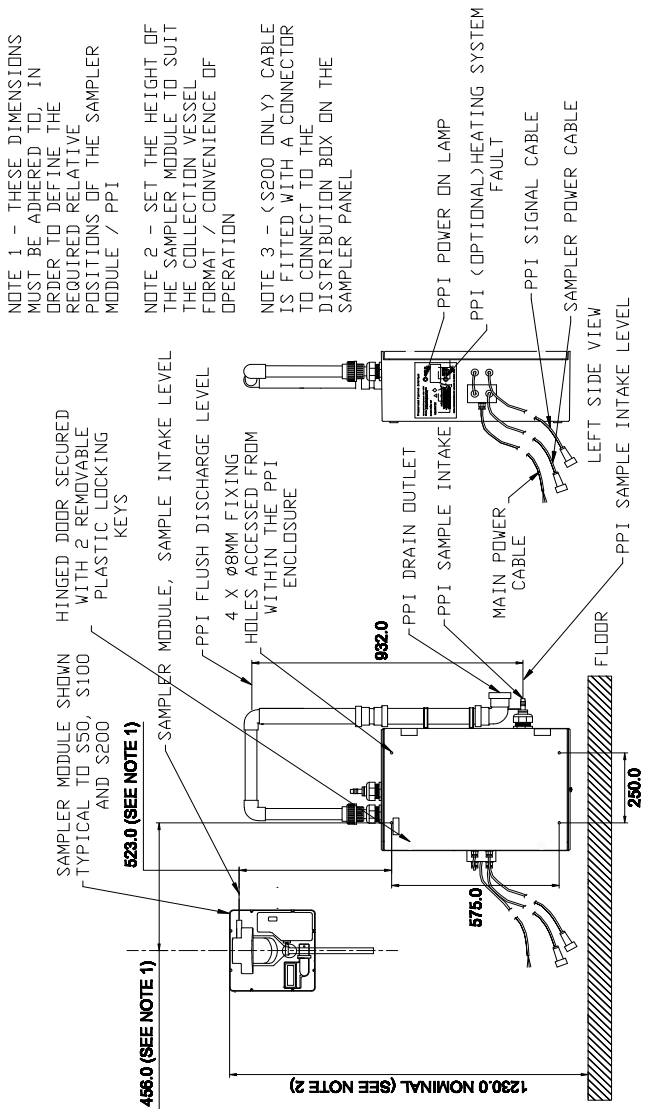
Pressurised Pipeline Interface (PPI) - Standard Version

First remove all packing material from the PPI and it's ancillaries.

Figure 4.K: Installation Drawing, Pressurised Pipeline Interface - Standard Version

PREPARING THE SITE

4.20



PPI Location

A wall or similar flat surface is required, on which to mount the PPI cabinet. The PPI should be positioned according to the Installation Drawing above

Gravity Drain Installation

Construct the drain from 56mm O/D plastic pipe. The drain should be coupled to the PPI Drain Outlet and should lead to a suitable disposal point. It may be possible to couple the PPI drain into the Wastewater Drain (if one is fitted), however care must be taken in configuring the drain to avoid any backflushing issues

Installing the Pressure Tapping

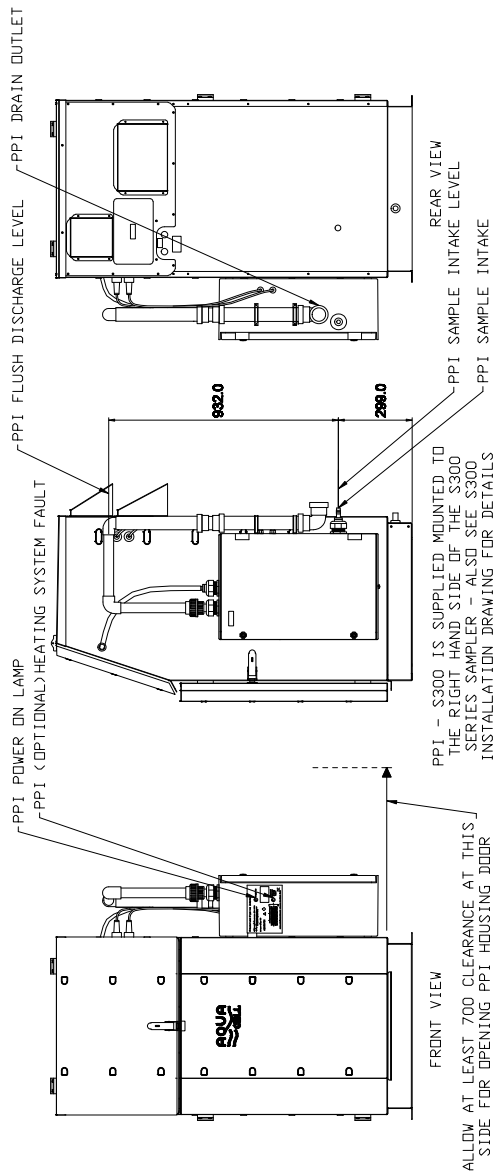
A suitable tapping point should be made and fitted with a hand operated Isolation Valve. The Pressure Tapping should be terminated in a 1/2" BSP female fitting, to which the PPI intake Hose can be connected.

Electrical Power Supply Installation

A suitable electrical supply should be provided for the PPI - see TECHNICAL SPECIFICATION, (page 8.6) which is terminated in a switched fused isolator, fused as indicated on the PPI Rating Label. The isolator should be mounted conveniently close to the PPI Power Input Cable Gland.

Pressurised Pipeline Interface (PPI) - S300 Version

Figure 4.L: Installation Drawing, Pressurised Pipeline Interface - S300 Version



Gravity Drain Installation

Construct the drain from 56mm O/D plastic pipe. The drain should be coupled to the PPI Drain Outlet and should lead to a suitable disposal point. It may be possible to couple the PPI drain into the Wastewater Drain (if one is fitted), however care must be taken in configuring the drain to avoid any backflushing issues.

Installing the Pressure Tapping

A suitable tapping point should be made and fitted with a hand operated Isolation Valve. The Pressure Tapping should be terminated in a 1/2" BSP female fitting, to which the PPI intake Hose can be connected.



4.24



5

INSTALLATION

Aquacell S50 Sampler

See page 4.1, Fig. 4.A, Installation Drawing, S50 Sampler.

Sampler

1. Drill the 2 mounting holes (using an 8mm masonry drill, if using the fixing bolts supplied) in the wall (or other appropriate vertical surface), and install the masonry bolts (or other appropriate fixings) at the designated points.
2. Install the Back-up Battery (if applicable) – See (Optional) Back-up Battery Installation (page 5.18).
3. Take note of the position and orientation of (optional) electrical connectors fitted to the bottom rear Connection Panel (if any are fitted), as this will be difficult to do when the sampler is in place and it is required to connect the corresponding cables.
4. Loosen the 2 fixing bolts slightly, in order to accommodate the keyhole cut-outs in the Sampler Module's mounting bracket. Hang the Sampler Module / bracket on the fixing bolts and tighten them up to secure the Sampler Module on its mount.
5. Connect the Mains cable to the switched, fused isolator^[1]. DO NOT SWITCH THE POWER ON AT THIS POINT.
6. Connect any other cables as appropriate to the Sampler Module – See Electrical Connections to the Sampler Module (page 5.2).
7. Install the Intake Hose – See Intake Hose Installation (page 5.14).

[1] PPI Standard Version - Do not connect the Sampler Module to the switched, fused Isolator. The power connection is routed via the PPI



Sample Collection Vessel (SCV)

1. Place the SCV (Single Container or Bottler as appropriate) beneath the sampler outlet (Pinch Valve Tube).
2. Place the Pinch Valve Tube in the top opening of the Container / Bottler. The tube should engage the Container / Bottler to a nominal depth of 60mm.

Electrical Connections to the Sampler Module

See Fig. 5.A: Wiring Details, Aquacell S50 Sampler.

Electrical connections to the Sampler Module are made principally via the connection panel at the bottom rear of the module.

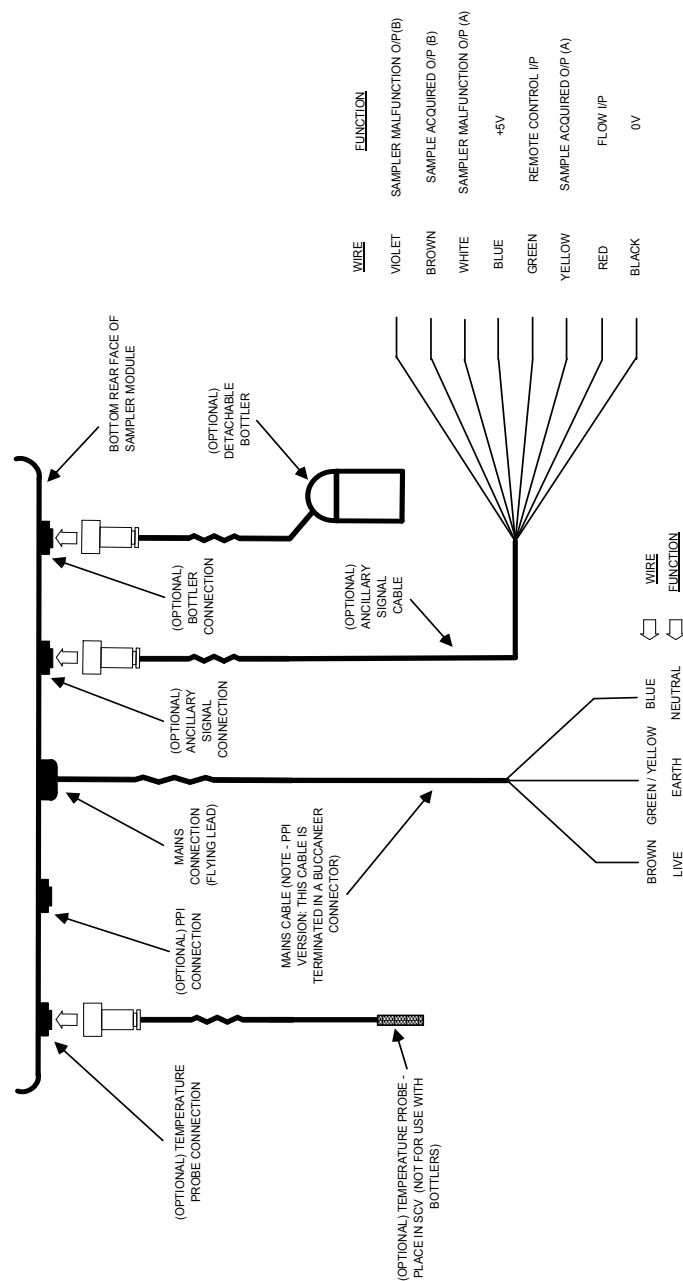
There is an (optional) USB connection on the front panel of the Sampler Module. This is intended for operator use as required, to download the Sampler's data logger and would not be involved at the installation stage.

The connection panel comprises a flying lead coming from a cable gland in the middle of the panel. This is the Mains Cable. In addition there are 4 (optional) waterproof connectors. (See Wiring Details).

When connecting a cable to a connector, first remove the connector sealing cap. Care should be exercised to correctly orientate the connectors, before applying any force, to mate one with the other. Having mated the connectors correctly, the retaining cover should be screwed in place, taking care to avoid cross-threading. If difficulty is experienced in engaging the threads, rotate the retaining cover in reverse until a click is heard. Then rotate the cover in a clockwise direction to secure the connector.



Figure 5.A: Wiring Details, Aquacell S50 Sampler



Aquacell S100 Sampler

See page 4.5, Fig. 4.C, Installation Drawing, S100 Sampler.

Sampler

1. Drill the 4 mounting holes (using an 8mm masonry drill, if using the fixing bolts supplied) in the wall (or other appropriate vertical surface), and install the masonry bolts (or other appropriate fixings) at the designated points.
2. Attach the Wall Mounting Plate to the mounting surface
3. Install the Back-up Battery (if applicable) – See (Optional) Back-up Battery Installation (page 5.18).
4. Take note of the position and orientation of electrical connector(s) fitted to the bottom rear Connection Panel, as this will be difficult to do when the sampler is in place and it is required to connect the corresponding cables.
5. Loosen the 2 wing nuts on the Wall Mounting Plate and hang the Sampler on the Mounting Studs. Hand -tighten the wing nuts to secure the sampler firmly in place.
6. Connect the Mains cable to the switched, fused isolator^[1]. DO NOT SWITCH THE POWER ON AT THIS POINT.
7. Connect any other cables as appropriate to the Sampler Module – See Electrical Connections to the Sampler Module (page 5.5).
8. Install the Intake Hose – See Intake Hose Installation (page 5.14).

5.4

Sample Collection Vessel (SCV)

1. Place the SCV (Single Container or Bottler as appropriate) beneath the sampler outlet (Pinch Valve Tube).

[1] PPI Standard Version - Do not connect the Sampler Module to the switched, fused Isolator. The power connection is routed via the PPI

2. Place the Pinch Valve Tube in the top opening of the Container / Bottler. The tube should engage the Container / Bottler to a nominal depth of 60mm.

Electrical Connections to the Sampler Module

See Figure 5B: Wiring Details, Aquacell S100 Sampler (page 5.6).

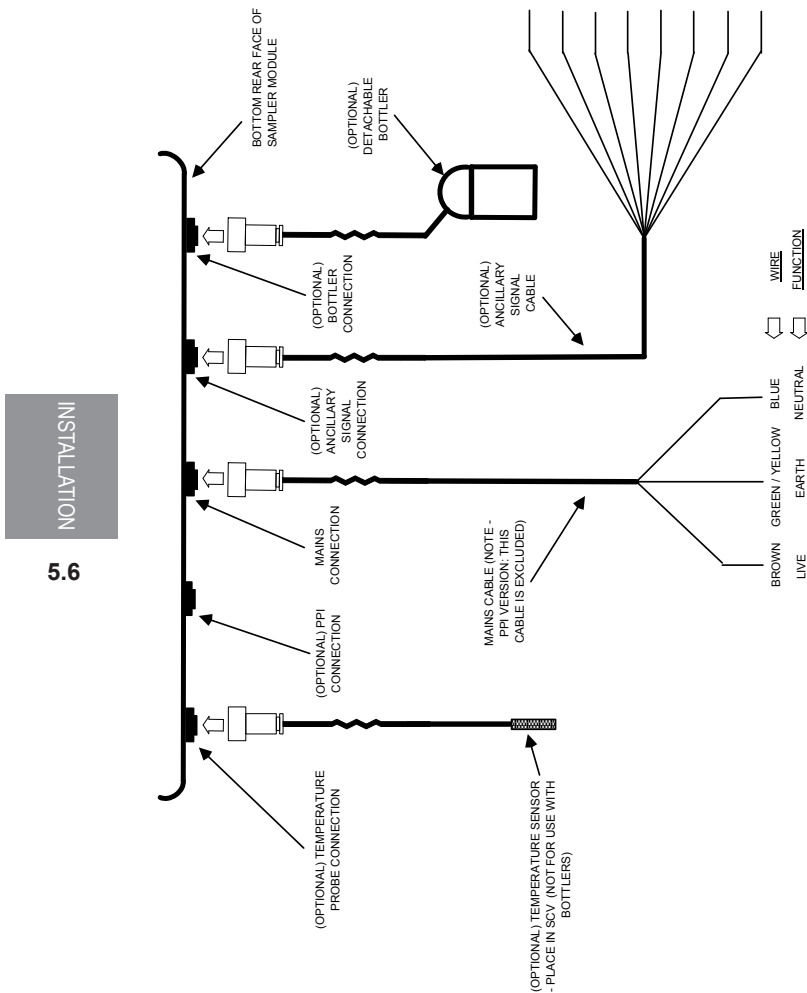
Electrical connections to the Sampler Module are made principally via the connection panel at the bottom rear of the module.

There is an (optional) USB connection on the front panel of the Sampler Module. This is intended for operator use as required, to download the Sampler's data logger and would not be involved at the installation stage.

The connection panel comprises a Mains connection and 4 (optional) additional connections. The connectors are all waterproof (See Wiring Details).

When connecting a cable to a connector, first remove the connector sealing cap. Care should be exercised to correctly orientate the connectors, before applying any force, to mate one with the other. Having mated the connectors correctly, the retaining cover should be screwed in place, taking care to avoid cross-threading. If difficulty is experienced in engaging the threads, rotate the retaining cover in reverse until a click is heard. Then rotate the cover in a clockwise direction to secure the connector.

Figure 5.B: Wiring Details, Aquacell S100 Sampler



Aquacell S200 Series Samplers

See Fig. 4.E, Installation Drawing, S200 Sampler (page 4.9).

Sampler

1. Move the Sampler on its wooden pallet, to a position close to the prepared base.
2. Remove the transit bolts attaching the Sampler to its pallet.
3. Carefully remove the Sampler from its pallet and position it on its prepared base.
4. Install the Back-up Battery (if applicable) – See (Optional) Back-up Battery Installation (page 5.18).
5. Connect the Mains cable from the Junction Box on the Sampler bracket to the switched, fused isolator^[1]. DO NOT SWITCH THE POWER ON AT THIS POINT.
6. Connect any other cables as appropriate to the Sampler Module – See Electrical Connections to the Sampler Module (page 5.7).
7. Install the Intake Hose – See Intake Hose Installation (page 5.14).

Sample Collection Vessel (SCV)

1. Place the SCV (Single Container or Bottler as appropriate) in the Lower Compartment beneath the sampler outlet (Pinch Valve Tube).
2. Place the Pinch Valve Tube in the top opening of the Container / Bottler. The tube should engage the Container / Bottler to a nominal depth of 60mm.
3. If the SCV is a Bottler, connect it to the Bottler Connection (The cable suspended from the top of the Lower Compartment)

[1] PPI Standard Version - Do not connect the Sampler Module to the switched, fused Isolator. The power connection is routed via the PPI

Electrical Connections to the Sampler Module

See Fig. 5.C: Wiring Details, Aquacell S200 Sampler (page 5.9).

Electrical connections to the Sampler Module are made principally via the connection panel at the bottom rear of the module. Only the (optional) Ancillary Signal Cable needs to be fitted during installation, as the other cable(s) are pre-connected.

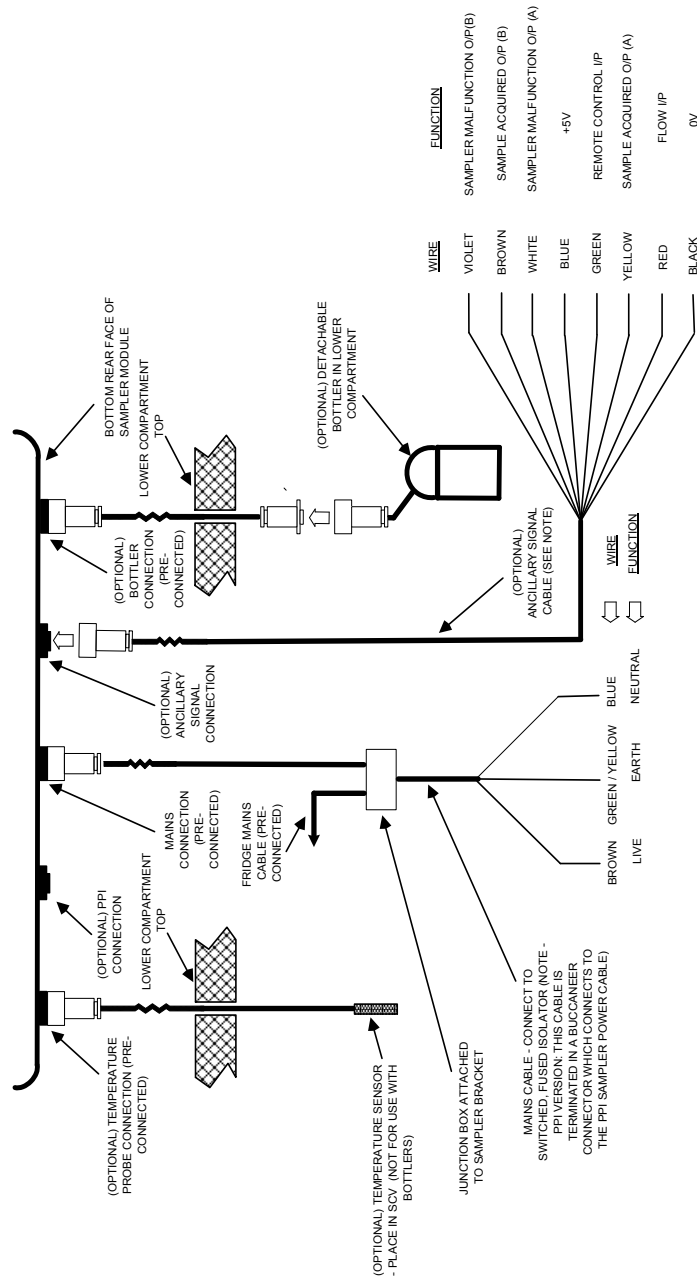
The (optional) Bottler connection is a waterproof in-line connector suspended from the top of the Lower Compartment.

There is an (optional) USB connection on the front panel of the Sampler Module. This is intended for operator use as required, to download the Sampler's data logger and would not be involved at the installation stage.

The connection panel comprises a Mains connection and 4 (optional) additional connections. The connectors are all waterproof (See Wiring Details).

When connecting a cable to a connector, first remove the connector sealing cap. Care should be exercised to correctly orientate the connectors, before applying any force, to mate one with the other. Having mated the connectors correctly, the retaining cover should be screwed in place, taking care to avoid cross-threading. If difficulty is experienced in engaging the threads, rotate the retaining cover in reverse until a click is heard. Then rotate the cover in a clockwise direction to secure the connector.

Figure 5.C: Wiring Details, Aquacell S200 Sampler





Aquacell S300 Series Samplers

See Figure: 4.G Installation Diagram S300 Series Sampler (page 4.12)

Sampler

1. Move the Sampler on its wooden pallet to a position close to the prepared base
2. Remove the transit bolts attaching the Sampler to its pallet.
3. Carefully remove the Sampler from its pallet and position it on the prepared base.
4. Fasten the Sampler down on the base using suitable fixing screws in the four 13mm fixing holes in the cabinet base flanges.
5. Attach the 2 Air Cows using the fixing screws provided. (S310H and S320H models only)
6. Connect up the gravity drain to the Condensate Drain outlet / Wastewater Drain outlet (if applicable).
7. Ensure the backup battery switch is set to the 'disconnected' position - see (Optional) Back-up Battery Installation (page 5.18)
8. Remove the Cover Plate on the Samplers Upper Rear Panel by removing the 4 fixing screws. This exposes the Samplers electrical terminals.
9. Install electrical connections - See Figure 5.D: Wiring Details, Aquacell S300 Series Samplers (page 5.12). DO NOT SWITCH THE POWER ON AT THIS POINT.
10. Replace the cover plate.
11. Install the Intake Hose – See Intake Hose Installation (page 5.14).

Sample Collection Vessel (SCV)

Single Containers / Detachable Bottlers

12. Place the SCV on the Tray in the Lower Compartment beneath the sample outlet (pinch valve tube).
13. Place the Pinch Valve Tube in the top opening of the Container / BotTLer. The tube should engage the SCV to a nominal depth of 60mm



14. If the SCV is a bottler, connect its cable to the Bottler Connection (the cable suspended from the top of the lower compartment of the Sampler Cabinet)

Integral Bottlers

Position Bottles/Bottle Carrier on the SCV tray as determined by the plastic location pegs.

(Optional) Auxiliary Equipment Mounting Plate

Attach the fully assembled / wired Equipment Mounting Plate to the 4 fixing points on the left-hand side of the Sampler using the fixing screws provided.

Connect the Ancillary Signal Cable to the 12-pole connector on the side of the Sampler.

Connect the Mains Supply Cable to the 3-pole connector on the side of the Sampler.

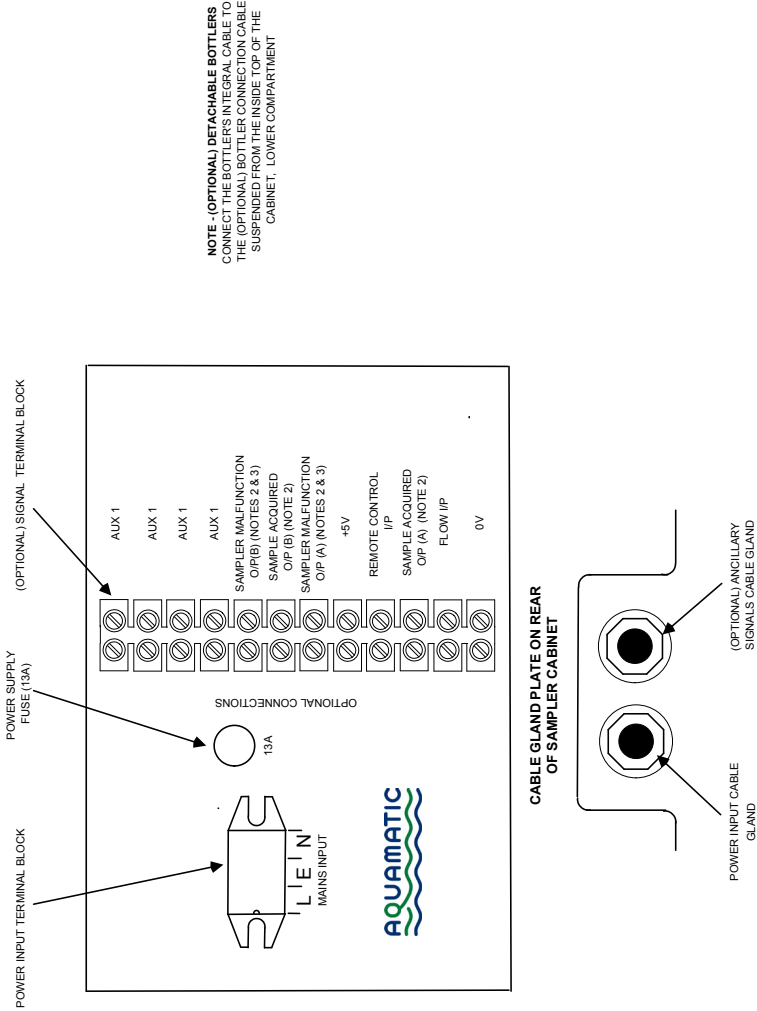
(Optional) Auxiliary Equipment Enclosure

Use the key provided to open the Enclosure door and gain access to the 4 fixing holes. Attach the fully assembled / wired Equipment Enclosure to the 4 fixing points on the left-hand side of the Sampler using the fixing screws provided.

Connect the Ancillary Signal Cable to the 12-pole connector on the side of the Sampler.

Connect the Mains Supply Cable to the 3-pole connector on the side of the Sampler.

TERMINAL APERTURE IN UPPER REAR PANEL OF SAMPLER CABINET
(REMOVE COVER PLATE FOR ACCESS)



Pressurised Pipeline Interface - Standard Version

See Figure 4.K, Installation Drawing, Pressurised Pipeline Interface - Standard Version (page 4.20).

1. Drill the 4 mounting holes (using an 8mm masonry drill, if using the fixing bolts supplied) in the wall (or other appropriate vertical surface), and install the masonry bolts (or other appropriate fixings) at the designated points.
2. Attach the PPI Housing to the mounting surface
3. Connect PPI Main Power Cable to the switched, fused isolator.
DO NOT SWITCH THE POWER ON AT THIS POINT.
4. Connect the PPI, Sampler Power Cable to the Power Cable connector (S50 and S200) or the Mains connector on the Sampler Module (S100) as appropriate.
5. Connect the PPI Signal Cable to the PPI connector on the Sampler Module
6. Install the Intake Hose – See Intake Hose Installation (page 5.14).

Pressurised Pipeline Interface - S300 Version

See Figure 4.L, Installation Drawing, Pressurised Pipeline Interface - S300 Version (page 4.22).

1. Install the Intake Hose – See Intake Hose Installation (page 5.14).

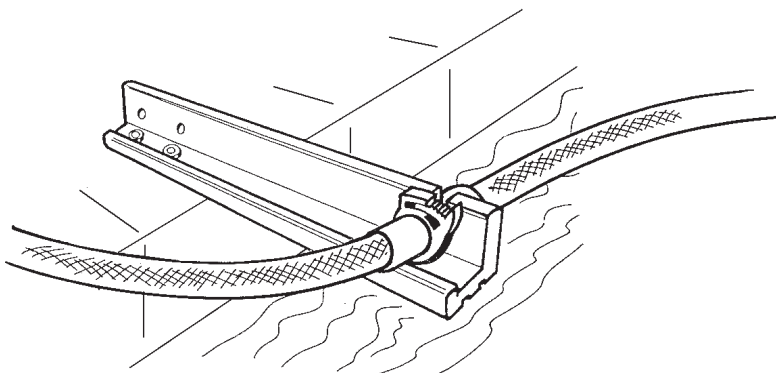
Intake Hose Installation

Non Pressurised Sampling Points

The Sampler is supplied with a standard 10 metre (S50 - 5 metre) long Intake Hose, which has an Intake Filter fitted at the Sampling Point End. The hose connects between the Sampling Point and the Sampler Module.

Installation Procedure:

- a. Install a suitable Intake Hose Support for the Sampling Point end of the Intake Hose. The illustration below shows the (optional) Intake Hose Support Bracket and is an example of how the hose is meant to be supported, although not suited to every application.



INSTALLATION

5.14

- b. Attach one of the two Intake Hose Anchors supplied, to the hose at a point such that, when it engages with the Intake Hose Support, the Intake Filter is suspended in the body of wastewater from which samples are to be extracted.

Note: The Intake Hose Anchor comprises a short silicone rubber split tube which wraps around the Intake Hose and a plastic tube clip which is tightened around the silicone rubber, using pliers. See illustration below:



- c. Suspend the Intake Hose in the flow by engaging the Intake Hose Anchor with the Intake Hose Support.
- d. Run the Intake Hose along its designated path up to the Sampler Intake.
- e. Attach the upper end of the Intake Hose to the Sample Intake:

S50 Sampler

Note: Strain relief for the upper end of the Intake Hose is not provided with the S50 and in applications where this is judged to be necessary; a suitable Strain Relief Bracket should be installed.

In many applications where there is just a short lift and the flow is not vigorous, strain relief of the upper end of the Intake Hose may not be necessary.

If strain relief is required for the upper end of the Intake Hose, proceed as follows:

- a. Attach a second Intake Hose Anchor to the upper end of the Intake Hose at a point such that, when it engages with the Strain Relief Bracket, it suspends in its intended manner.
- b. Suspend the Intake Hose by engaging the Intake Hose Anchor with the Strain Relief Bracket.
- c. Cut the Intake Hose to length so that the free end is able to engage with the Intake Pipe on the Sampler Module (Allow about 20mm of hose to engage with the Intake Pipe).
- d. Place the Intake Hose Clip over the free end of the Intake Hose and soften the end of the hose by the application of heat using a hot air gun.
- e. Push the hose onto the Intake Pipe so that approximately 20mm is engaged and secure in place by tightening the Intake Hose Clip, using pliers.

Note: If strain relief is not required for the upper end of the Intake Hose, proceed from c) above.

S100 and S200 Samplers

Attach the Strain Relief Bracket supplied to the side of the Sampler Module using the 2 M4 screws/washers.

- a. Attach a second Intake Hose Anchor to the upper end of the Intake Hose at a point such that, when it engages with the Strain Relief Bracket, it suspends in its intended manner.
- b. Suspend the Intake Hose by engaging the Intake Hose Anchor with the Strain Relief Bracket
- c. Cut the Intake Hose to length so that it is able to engage with the Intake Pipe on the Sampler Module (Allow about 20mm of hose to engage with the Intake Pipe).
- d. Place the Intake Hose Clip over the upper end of the Intake Hose and soften the end of the hose by the application of heat using a hot air gun
- e. Push the hose onto the Intake Pipe so that approximately 20mm is engaged and secure in place by tightening the Intake Hose Clip.

S300 Series Samplers

Note: Strain relief for the upper end of the Intake Hose is provided by a plastic gland in the Right Hand Side Panel of the Sampler Cabinet.

- a. Thread the upper end of the Intake Hose through the plastic gland in the Right Hand Side Panel of the Sampler Cabinet
- b. Attach a second Intake Hose Anchor to the upper end of the Intake Hose at a point such that, when it engages with the plastic gland in the Right Hand Side Panel of the Sampler Cabinet, it suspends in its intended manner.
- c. Suspend the Intake Hose by engaging the Intake Hose Anchor with the plastic gland in the Right Hand Side Panel of the Sampler Cabinet
- d. Cut the Intake Hose to length so that it is able to engage with the Intake Pipe on the Sampler Module (Allow about 20mm of hose to engage with the Intake Pipe).
- e. Place the Intake Hose Clip over the upper end of the Intake Hose and soften the end of the hose by the application of heat using a hot air gun
- f. Push the hose onto the Intake Pipe so that approximately 20mm is engaged and secure in place by tightening the Intake Hose Clip.

Pressurised Sampling Points - Samplers incorporating The Pressurised Pipeline Interface (PPI)

The Sampler is supplied with 2 intake hoses; a standard 10 Metre length Intake Hose, with a fixing Flange fitted to one end, to connect from the Sampling Point, to the PPI, and a Short Hose to connect from the PPI to the Sampler Module.

Installation Procedure:

1. Couple the 1/2" BSP Tapered Male Fitting at the Sampling Point End of the 10 Metre Intake Hose to the pre-installed Pipeline Tapping Point (Use PTFE tape to seal the joint).
2. Run the Intake Hose along its designated path to the Pressurised Pipeline Interface Intake. (The 16mm Hose Tail Fitting, protruding from the right hand side of the Pressurised Pipeline Interface Enclosure)
3. Cut the Intake Hose to length so that it is able to engage with the Pressurised Pipeline Interface Intake (Allow about 30mm of hose to engage with the 16mm Hose Tail Fitting).
4. Place the Intake Hose Clip supplied over the PPI end of the Intake Hose and soften the end of the hose by the application of heat using a hot air gun
5. Push the hose onto the PPI Intake Hose Connector so that approximately 30mm is engaged and secure in place by tightening the Intake Hose Clip, using a screwdriver.
6. Place the other Intake Hose Clip supplied over the PPI end of the Short Hose (the plain end) and soften the end of the hose by the application of heat using a hot air gun.
7. Push the hose onto the PPI Outlet Hose Connector so that approximately 30mm is engaged and secure in place by tightening the Inlet Hose Clip, using a screwdriver.
8. Connect the other end of the Short Hose to the Intake Pipe on the Sampler Module.

Note: S300 Series Samplers – The Short Hose is pre-installed, so ignore 6. onwards, above.



(Optional) Back-up Battery Installation

S50 / S200 Samplers

Place the battery in the battery cavity at the rear of the Sampler Module and secure it in place with the rubber cord, by stretching it over the battery / battery connecting cable and attaching it to the metal clip at the top of the battery cavity. Do not connect the battery to the Sampler Module at this point ^[1].

S100 Sampler

1. Release the toggle latch securing the hinged Battery Cover, at the rear of the Sampler Module and open the Battery Cover, to reveal the battery cavity.
2. Place the battery in the battery cavity and secure it in place with the rubber cord, by stretching it over the battery / battery connecting cable and attaching it to the metal clip at the top of the battery cavity. Do not connect the battery to the Sampler Module at this point ^[1].
3. Close the Battery Cover and secure the toggle latch.

S300 Series Samplers

The Back-up Battery is pre-installed in S300 Series Samplers and has a rocker switch mounted on the Sampler Panel, used to disconnect or connect the battery as required. This switch should be set to the “Disconnected” position as the Back-up Battery should not be connected at this point ^[1].

[1] **IMPORTANT:** The Back-up Battery, should not be connected to the Sampler and left for an extended period (more than 24hrs) before the system is commissioned, as it may become fully discharged. If this happens, battery / Sampler damage could result.



6

OPERATION

Definitions

AQUACELL SAMPLER	The basic Aquacell Air Pump Vacuum Sampler.
AQUACELL SAMPLER IN PPI MODE	The Aquacell Sampler combined with the Pressurised Pipeline Interface (PPI).
SAMPLING POINT	The precise position within a sampling location from which samples are taken.
SAMPLING CYCLE	The sequence of operations the Sampler carries out in order to extract a shot of the liquid to be sampled.
SHOT	An aliquot of liquid extracted from the sampling point by a single operation of the sampling cycle.
SAMPLE	A shot or number of shots extracted in immediate succession and deposited into a single collection vessel.
GROUP SAMPLE	A series of shots extracted in immediate succession and split between a predetermined group of collection vessels. See Programming Procedure, <i>SYSBOT04</i> (page 6.28).
COMPOSITE SAMPLE	Samples are extracted at equal time or flow increments and deposited into a single vessel. This enables the average result of a desired characteristic to be obtained.



Definitions (Continued)

DISCRETE SAMPLES	Samples are extracted at equal time or flow increments and deposited into a number of separate vessels in turn. This enables the results of a desired characteristic to be made over time.
FLOW PROPORTIONAL SAMPLING	A Sample is taken for every x litres of flow passing the Sampling Point.
SPOT SAMPLE	A Sample taken by pressing the SPOT SAMPLE button.
SAMPLE PROGRAM	A user programmed sequence of Samples which occur when the RUN PROGRAM button is pressed.
SAMPLING PERIOD	The Sampler's programmed window of operation during a Sample Program
SAMPLE ROUTINE	A sequence of Samples taken during a Sampling Period
SYSTEM SETTINGS	System operating parameters as selected by the user for the application.
PROGRAM SETTINGS	The common variables including Start Time, Stop Time, Sample Frequency and Bottle Increment Frequency, separated off to simplify programming.
SAMPLING EVENTS	Normal events relating to the Sampler's operation which are registered by the Sampler and stored in its Data Logger.
WARNING EVENTS	Abnormal events relating to the Sampler's operation, which are registered by the Sampler and stored in its Data Logger.
SAMPLE COLLECTION VESSEL (S.C.V.)	The container, within which samples are stored, until collected for analysis.

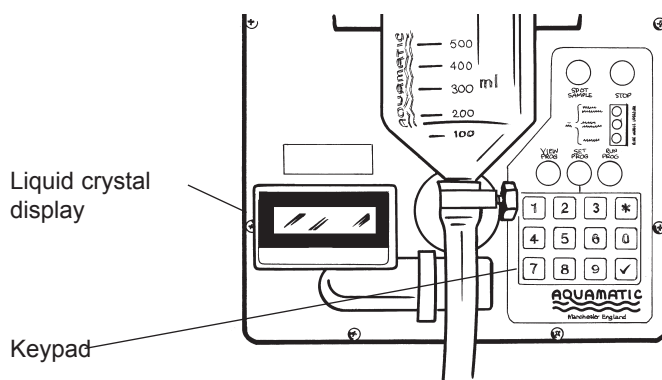


Basic Operations

Controlling the Sampler

The Sampler is operated / programmed using the 17 button membrane keypad in conjunction with a 16 x 2 character liquid crystal display. When a button is pushed on the keypad a beep sound will be heard.

Figure 6.A: Front Panel Controls of The Sampler Unit



The keypad is divided into circular operating buttons and square programming buttons:

Operating Buttons

SPOT SAMPLE	To take single samples.
SET PROG	To enter or change a program.
VIEW PROG	To assess program entered.
RUN PROG	To operate Sampler using set program.
STOP	This button causes the Sampler to stop mid program or mid spot sample cycle.

Programming Buttons

*	Step through available menus or return to the start of a date / time entry.
0 - 9	Numerical selections.
✓	Enter / move to next selection.

Switching on the Power

When the Sampler is powered up, it carries out an initialization sequence which varies according to the Sampler Model. In addition to this, heating / cooling components may start up, dependent on the Sampler Model and the ambient temperature.

Sampler Module, Initialization Sequence

S50 / S100 / S200 / S310 (Basic Model) Samplers

Switch the Sampler's separate Mains Isolator on. The Sampler Module carries out the following initialization sequence, with the Display showing, in turn:

**SAMPLER FIRMWARE
S3.0.0.1**

(The bottom row shows the current Firmware version) then, either

**AQUACELL
READY**

if the Sampler is a basic Aquacell Sampler, or

**AQUACELL READY
++PPI MODE++**

if the Sampler is being used with a Pressurised Pipeline Interface (PPI) to sample from a pressurised Sampling Point.

The last 2 displays above are known as **DEFAULT DISPLAYS** for the Aquacell Sampler and the Aquacell Sampler in PPI mode respectively.

If one or more **Warning Events** (See **Warning Events**, page 6.44 for details) are present at Power Up, the display will show each Warning Event for 4 seconds, alternating with the **DEFAULT DISPLAY**. After the specific Warning Events have been shown, the display will show:

**WARNING OCCURED
PRESS VIEW**

This display will then alternate with the **DEFAULT DISPLAY**. In this way the user will be alerted to the presence of any Warning Events which exist at the point of switch-on.

S310 with optional Beacon and/or Interior Light / S310H / S320 / S320H Samplers

Switch the Sampler's separate Mains Isolator on. The Sampler Module carries out the following initialization sequence, with the display showing, in turn:

SAMPLER FIRMWARE

S3.0.0.1

then

PT CTL FIRMWARE

P2.0.0.1

(The bottom rows of the 2 displays above, show the current Firmware versions) then, either

**AQUACELL
READY**

if the Sampler is a basic Aquacell Sampler, or

**AQUACELL READY
++PPI MODE++**

if the Sampler is being used with a Pressurised Pipeline Interface (PPI) to sample from a pressurised Sampling Point.

The last 2 displays above are known as **DEFAULT DISPLAYS** for the Aquacell Sampler and the Aquacell Sampler in PPI mode respectively.

If one or more **Warning Events** (See **Warning Events**, page 6.44 for details) are present at Power Up, the display will then, show each Warning Event for 4 seconds alternating with the **DEFAULT DISPLAY**. After the specific Warning Events have been shown, the display will show:

**WARNING OCCURED
PRESS VIEW**

This display will then alternate with the **DEFAULT DISPLAY**. In this way the user will be alerted to the presence of any Warning Events which exist at the point of switch-on.

Heating / Cooling Component Start-up

S50 / S100 / S310 Samplers

Not applicable as there are no Heating / Cooling Components associated with these Samplers.

S200 Samplers

Switch the Samplers separate Mains Isolator on. The Samplers refrigeration unit, and circulatory fans, mounted inside the Samplers Lower Compartment at the top of the rear wall, start up.

S310H / S320 / S320H Samplers

Switch the Samplers separate Mains Isolator on. The table below shows the heating / cooling components associated with each Sampler model and what to expect, at switch-on.

Sampler Models with included Plant Items Indicated			Plant Item	Location in the Sampler Cabinet	Action At Switch-on
S310H	S320	S320H			
✓		✓	Plant Zone Heater	In the Plant Zone ^[1] adjacent to the Plant Zone Fan	Switches on at Plant Zone temperatures below 15°C.
✓	✓	✓	Plant Zone Fan	In the Plant Zone ^[1]	Starts to run
		✓	Vent Fan	Top rear of the Sampler Cabinet	Starts to run at Plant Zone temperatures above 32°C.
✓	✓	✓	CZ Heater	In the Container Zone ^[2] mounted on the roof of the Lower Compartment behind the Compartment Liner	Switches on at Container Zone temperatures below 1°C.
✓	✓	✓	CZ Fan	In the Container Zone ^[2] behind the vented front upper panel of the Compartment Liner	Starts to run

S310H	S320	S320H	Plant Item	Location in the Sampler Cabinet	Action At Switch-on
	✓	✓	Fridge	In the Plant Zone ^[1]	Starts to run after an initial delay of 3 minutes, provided the ambient temperature is above 3°C

[1] The Plant Zone (PZ) is the space, within the Upper Compartment of the Sampler Cabinet.

[2] The Container Zone (CZ) is the space, within the Lower Compartment of the Sampler Cabinet.

Switching on the (Optional) Back-Up Battery

Basic (For S50, S100 and S200 Samplers)

1. Release the Latch at the rear of the Sampler Module and open the hinged Battery Cover.
2. Connect the Battery to it's cable using the red and black connector.

S300 Series

1. Switch the Back-Up Battery Switch on the Cabinet Front Panel, above the Sampler Module to the CONNECTED position.

CAUTION

Always disconnect the Back-Up Battery during prolonged (> 24 hours) power outage, or damage could result.

Taking a Spot Sample

With the Display showing the **DEFAULT DISPLAY**, Press the **SPOT SAMPLE** button on the Keypad. The Sampler should extract a Single Shot Sample of water from the Sampling Point and deposit it in the Sample Collection Vessel, according to the **SAMPLING CYCLE**.

The **SAMPLING CYCLES** for the basic Aquacell Sampler and the Aquacell Sampler in PPI mode are as follows:

Basic Aquacell Sampler

1. The Display shows:

**SAMPLING NOW
CLOSE VALVE**

2. Wait for 1 second.
3. The Pump runs and the Pinch Valve closes.
4. Wait for 3 seconds.
5. Air is blown out of the Intake Hose for a short period (**PRE PURGE** time - factory set to 3 seconds).
6. The Display shows:

**SAMPLING NOW
PRE PURGE**

7. A Sample is drawn up the Intake Hose and fills the Sample Chamber up to the level of the lower tips of the 2 Long Electrodes.
8. The Display shows:

**SAMPLING NOW
INTAKE**

9. Water is expelled from the Sample Chamber back up the Volume Control Tube and down the Intake Hose until the level reaches the bottom of the Volume Control Tube. (A metered volume is thus trapped in the Sample Chamber.) This second air purge continues until water is completely removed from the Sample Tract (**POST PURGE** time - factory set to 6 seconds).

10. The Display shows:

**SAMPLING NOW
POST PURGE**

11. The Pinch valve opens and the Sample is expelled from the Sample Chamber into the Sample Collection Vessel.

12. The Display shows:

**SAMPLING NOW
SAMPLE RELEASE**

13. Wait for 2 seconds.

14. The Pump stops and the Display returns to the **DEFAULT DISPLAY**.

Aquacell Sampler in PPI mode

1. The Display shows:

**SAMPLING NOW
CLOSE VALVE**

2. Wait for 1 second.
3. The PPI pump runs and V2^[1] opens.
4. Wait for 6 seconds.
5. The Sampler Module Pump runs and the Pinch Valve closes.
6. Wait for 3 seconds.
7. Air is blown through the Sampler Module's Intake Hose (which connects between the Sampler Module and the PPI), to purge the V2^[1] branch of the PPI Sample Tract of residual water.

The Display shows:

**SAMPLING NOW
PRE PURGE**

8. Wait for 1 second.
9. V2^[1] closes, whilst the air is purging through it.
10. Wait for 1 second.
11. The Sampler Module Pump and the PPI Pump, stop.
12. Wait for 1 second.
13. The PPI Pump starts.

The Display shows:

**SAMPLING NOW
WAITING FOR PPI**

14. V1^[1] opens and water is allowed to flush from the Sampling Point, through the PPI, to drain for a period sufficient to completely purge, residual water (This time is set up during commissioning).
15. V1^[1] closes to isolate the Sampling Point and the PPI Pump stops.
16. Wait for 2 seconds.
17. The PPI Pump starts and V2^[1] opens to present the water trapped in the PPI Sample Tract, to the Sampler Module.
18. Wait for 6 seconds.

19. The Sampler Module Pump runs and a Sample is drawn up the Sampler Module's Intake Hose and fills the Sample Chamber up to the level of the lower tips of the 2 Long Electrodes.

The Display shows:

**SAMPLING NOW
INTAKE**

20. Water is expelled from the Sample Chamber back up the Volume Control Tube and down the Sampler Module's Intake Hose until all the water in the Intake Hose is removed. A metered volume is thus trapped in the Sample Chamber below the level of the lower end of the Volume Control Tube.

21. Wait for 10 seconds.

The Display shows:

**SAMPLING NOW
POST PURGE**

22. The Pinch Valve opens and the Sample is expelled from the Sample Chamber into Sample Collection Vessel.

The Display shows:

**SAMPLING NOW
SAMPLE RELEASE**

23. Wait for 2 seconds

24. The PPI Pump stops, V2^[1] closes, the Sampler Module Pump stops and the Display returns to the **DEFAULT DISPLAY**

[1] V1 and V2 are the main valves in the PPI. V1 connects the Pressurised Sampling Point to the PPI and V2 connects the PPI to the Sampler Module. These valves cannot be seen in normal operation, as they are contained within the PPI enclosure, however it is possible to hear the pneumatic actuation of the valves.

Setting the Purge Times - Basic Aquacell Sampler

Pre Purge Time

The time required, to expel the column of water from the submerged sample Intake Hose. This time is factory set to 3 seconds.

The **PRE PURGE** time should be long enough to ensure that water is expelled from the Intake Hose followed by bubbles being emitted from the end of the Intake Hose for approximately 2 seconds.

Post Purge Time

The time required, to expel the excess water from the Sample Chamber and in turn, the Intake Hose. This time is factory set to 6 seconds.

The **POST PURGE** time should be long enough to ensure that water is expelled from the Sample Chamber / Intake Hose followed by bubbles being emitted from the end of the Intake Hose for approximately 2 seconds.

Both times are adjusted (if necessary), by taking repeated spot samples and successively changing the time(s) (see **Programming the Sampler** below) until the above criteria are met.

Note There is no benefit in setting the Purge Times longer than stated above. Setting long Purge Times will yield a shorter Back-Up Battery operating time capability (Samplers with Back-Up battery fitted) and cause unnecessary wear on the Sampler.

Setting the Flush Time - PPI

The PPI Flush Time should be long enough to be sure that all of the residual water is expelled from the PPI pipe tract. In order to achieve this a volume of water equal to the volume of the PPI pipe tract is flushed though the tract from the Sampling Point to the PPI Drain Outlet each time a sample is taken. The volume discharging from the PPI Drain Outlet is supplemented by the residual water in the tract at the commencement of the sample. The total volume to be discharged from the PPI Drain Outlet at each sample (V) can be calculated as follows:

The volume of the PPI pipe tract (less the Intake Hose) = V_{ppi} (850ml)

The volume of the Intake Hose is V_{hose} (122ml per metre of Intake Hose)

The length of the Intake Hose is L (metres)

The approximate volume of residual water in the PPI pipe tract at the commencement of each sample is V_{res} (175ml)

$$V = V_{ppi} + L \times V_{hose} + V_{res}$$

Thus the volume $V = 1025\text{ml} + L \times 122\text{ml}$ which is easily calculated, if the length of the Intake Hose is known.

The time for volume V to be discharged from the drain is established by taking repeated samples, checking the volume and adjusting the PPI Purge Time accordingly

Notes:

1. In applications where the Tapping Point pressure can vary it is important to set the Flush Time, to be sufficient to achieve V, even at the lowest pressure.
2. To measure V it may be necessary to temporarily disconnect the drain from the PPI Drain Outlet and allow the discharge to be collected in a suitable measuring bucket.
3. the PPI is controlled using a PLC (Programmable Logic Controller) unit contained within the PPI housing.
4. To adjust the PPI Flush Time it is necessary to open the door of the PPI housing to gain access to the PLC unit. As this operation must be carried out whilst the Power is on, **great care must be exercised to avoid contact with any exposed electrical components. This operation should only be carried out by a skilled technician.**

To set the PPI Flush Time Proceed as follows:

1. Open the door to the PPI Housing using one of the triangular keys provided.
2. Locate the PLC unit - See illustration below



3. The Display should show the Standby Screen as follows:

p1.1

**PRESSURISED PIPE
INTERFACE READY**

Note: p1.1 on the top line of the Display is the software release number

4. Press button **A**

5. The Display should show:

**FLUSH TIME (SV1):
15 seconds
PRESSURE PIPE
INTERFACE READY**

Note: A Flush Time of 15 seconds is set in the factory.

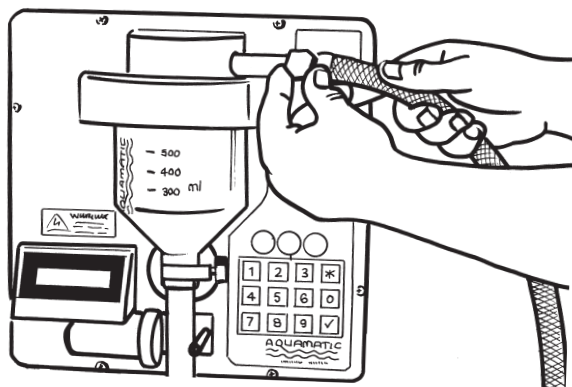
6. Press **OK**. The **15** (or the current set time) begins flashing.
7. Use the **+** and **-** buttons to set the required PPI Flush Time between 1 second and 60 seconds
8. Press the OK button to set this figure into the Controller memory.
9. Press button **A** to return to the Standby Screen.

Removing / Refitting the Sample Chamber

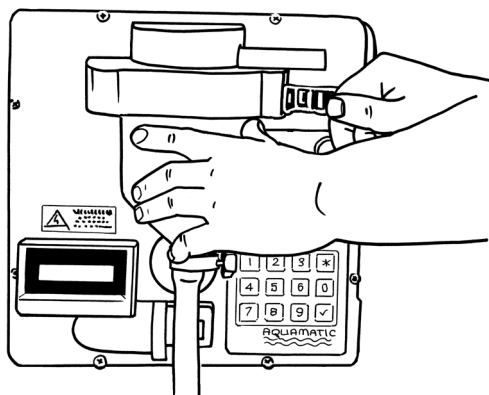
Removing and refitting the Sample Chamber is necessary when changing the Sample Shot Volume and when cleaning, it is therefore useful to become familiar with this simple operation.

Proceed as follows:

1. Remove the Intake Hose.

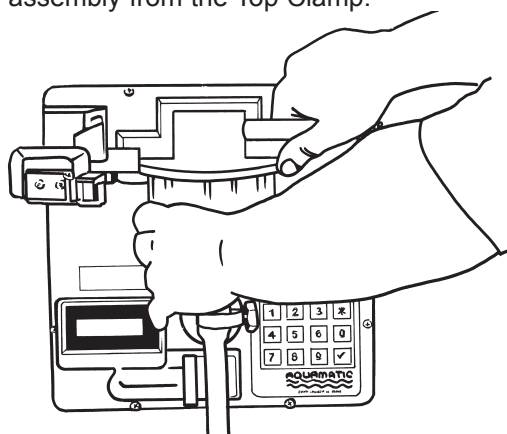


2. Release the Retaining Clip at the right side of the Top Clamp.



3. Hinge open the Top Clamp whilst gripping the Sample Chamber to ensure that it stays in place.

4. Gripping the Chamber Top Pipe with one hand and the Sample Chamber with the other, carefully release the Sample Chamber / Chamber top assembly from the Top Clamp.



5. Remove the Chamber Top assembly from the Sample Chamber assembly using the Top Pipe as a lever.

Carry out the above procedure in reverse order to replace the Sample Chamber.

Changing the Sample Shot Volume

The Sampler is factory set to extract a nominal 100ml Sample Shot Volume and in the majority of applications, this is adequate. Certain applications, however may require a Sample Shot Volume which differs from the factory set volume.

To change the Sample Shot Volume, it is necessary to change the length of the Volume Control Tube. To change the length of the Volume Control Tube, remove the Sample Chamber and cut the Volume Control Tube to the length required. The scale on the side of the Sample Chamber can be used, to gauge the length of the Volume Control Tube, required to achieve the desired shot volume. (A spare length of silicon rubber tube is included with the Sampler for use when the Volume Control Tube needs to be longer than that fitted).



Precision Sample Shot Volumes

Where a more precisely determined Sample Shot Volume is necessary, the volume can be measured using a suitable measuring cylinder. Samples are deposited into the measuring cylinder and the volume noted. The Volume Control Tube length is progressively adjusted between Samples until the required Sample Shot Volume is achieved. Having achieved the required volume, the Air Pump Vacuum Sampling System, employed by the Sampler, ensures that this volume will be repeated indefinitely.

Note 1: Sample shot volume repeatability is degraded at volumes in excess of 400ml.

Note 2: The Sample Shot Volume is limited to a maximum of 100ml when the Sampler is used with either of the 12 bottle Bottlers.

Note 3: The Sample Shot Volume is limited to a maximum of 300ml when the Sampler is used in PPI mode

Sampling Frequency

The need to sample automatically arises because of the continuously changing flow and composition of the wastewater. It is therefore essential to take Samples over the entire period that the liquid flow is being examined.

The frequency of Sampling during the Sampling Period, is often related to the volume of wastewater, which passes the Sampling Point during the Sampling period i.e. Flow Proportional Sampling.

For these applications the Sampler can be connected to a suitable Flow Meter and programmed to take Flow Proportional Samples in one of two ways:

1. A Contact Closure Flow Impulse output from the flowmeter is fed to the sampler. The Sampler is programmed take a sample for every X flow impulses, where X is a chosen Flow Increment to suit the application.
2. A 4 – 20mA Flow Signal output from the Flowmeter is fed to the Sampler. The Sampler integrates this signal and produces a Sample command at equal Flow Increments. The interval between Samples at maximum flow (20mA), is programmed to suit the application.

Note In applications where the flow is constant it is sufficient to take Time Interval Samples.

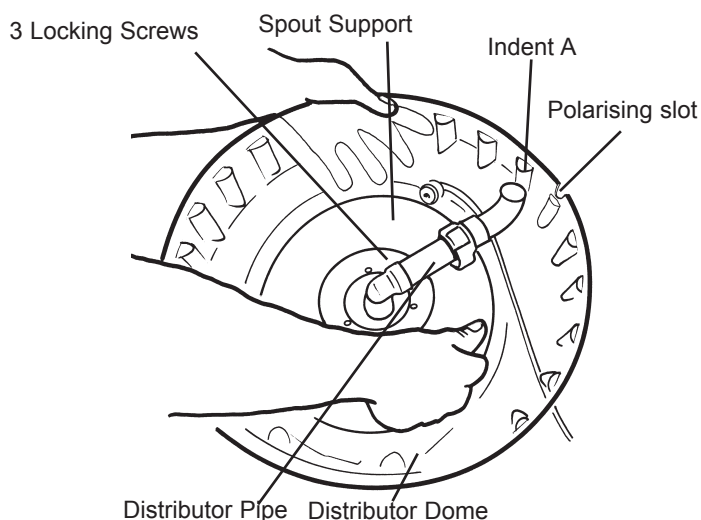


Having established the need to take Samples at equal Flow Increments, consideration should be given to the actual size of the increment. You should be sure that the Flow Increment is not so big that short-term changes in the constituents of the wastewater are ignored if they occur between Samples. On the other hand Sampling Frequency should always be kept to a minimum to minimise wear on the Sampler.

Distributor Pipe Alignment

The Distributor Pipe alignment is factory set and the only time it should need altering it is if you decide to change Bottle Configuration.

The illustration below shows the Distributor Assembly for the Removable Bottler. The Removable Bottler and the Integral Bottler both use the same Distributor Mechanism so the procedure for aligning the Distributor Pipe, applies to both.



Bottles are arranged in a circular format and are numbered in a clockwise direction (looking on top of the Bottles) from Bottle 1 (The Bottle which is addressed first during a Sampling Period) to Bottle X (where X is the number of Bottles in the configuration).



In order to observe the Distributor Pipe Outlet alignment and begin the re-alignment procedure if necessary, it is first essential to drive the Bottler Mechanism to its Home position. this is done by temporarily initiating a Sample Program (see below for details) and aborting it after the Bottler Mechanism has Homed.

Generally the Distributor Pipe Outlet should align centrally over Bottle 1, when the Bottler Mechanism is in its Home position.

The only exception to this is the 12 x 0.75 litre Glass Bottler and the 12 x 1 litre PET Bottler where the Distributor Pipe Outlet is aligned clockwise of the Bottle 1 position (looking on top of the Bottles) in line with Indent A (See illustration above). These Bottlers feature a Distribution Tray to direct the Samples into the narrow necked bottles. The Distribution Pipe Outlet is ofset so that the liquid is poured onto the sloping face of the Distributor Tray Recesses, rather than directly through the opening. This avoids unnecessary splashing and the danger of water flowing over the barrier between Bottles.

The Bottle 1 position is different for different Bottlers. In the case of the Removable Bottlers, plus the 2 x 4.5 litre Self-Emptying Polypropylene Integral Bottler, the Bottle 1 position is indicated on the Label, on the Distributor Dome. In the case of the Integral Bottlers apart from the Self-Emptying Bottler, the Bottle 1 position is indicated on the Pull-Out Tray.

To adjust the Distributor Pipe alignment, proceed as follows (see illustration above):

1. Ensure, the Distributor Mechanism / Pipe is in the Home (Bottle 1) position.
2. Loosen the 3 Locking Screws.
3. Rotate the Spout Support on it's friction bearing until the desired alignment is reached.
4. Tighten the Locking Screws.
5. Carry out a wet test to ensure that the Sample enters the Container correctly (readjusting if necessary).

Advanced operations

Having become familiar with the basic operations of the Sampler, the next thing to consider is how to program the Sampler to carry out a whole sequence of Sample Shots for your particular application.



Programming the Sampler

Programming should start with the LCD screen on the Sampler Module showing one of the 2 **DEFAULT DISPLAYS** - Either:

AQUACELL
READY
or
AQUACELL READY
++PPI MODE++

Before attempting to program the Sampler, please note the following simple rules:

1. When in the programming mode the top line of the Display indicates parameters where a user choice is available and the bottom line of the Display indicates the option currently selected.
2. An * positioned top right of the display invites you to press the "*" button one or more times to reveal all the options available.
3. When you reach the desired option you should press the "✓" button to enter your choice and move on to the next parameter.
4. When the choice is a numerical one, such as date / time, then the entire bottom line of the Display will flash. This is an invitation to either accept the entry as it is by pressing the "✓" button, or to change it by entering one digit at a time starting with the first digit on the left of the Display. Successive digits will flash in turn. When you have completely entered your choice the bottom line of the Display will flash once more, inviting you to either accept or amend the entry.
5. When the choice is a numerical one, but with limited selection, such as **NUMBER OF BOTTLE LOCATIONS**, the * will appear and the procedure, is as described above.
6. 24 hour clock time settings are used throughout.

First you will be asked to **SELECT MODE** and given the option of either **SYSTEM-SETTINGS** i.e. checking / amending the Samplers basic System Set-up, or **PROGRAM SETTINGS** i.e. checking / amending the Samplers "day-to-day" Program.

When you first operate the Sampler you will need to check that the Samplers System Settings are in keeping with the requirements of your particular application, so choose **SYSTEM SETTINGS** and proceed to check / amend the various options available.

The majority of users will only have a very simple application – operating continuously and taking samples at regular intervals, for example. These users will soon find that they are negating most options and so ensuring the absolute simplicity of programming the Sampler. In these applications, programming the Sampler would involve setting just one parameter – **INTERVAL**.

Although many Sampler applications are undoubtedly simple in the extreme, there are also applications where it is invaluable to be able to exercise one or more, of the many system options available to the Aquacell user.

Having programmed **SYSTEM SETTINGS**, you will find that the Screen reverts to **PROGRAM SETTINGS**. Check / amend the Program Options (these options will be appropriate to the system you have just programmed) and the Sampler is programmed.

In future, providing that you do not wish to change any System Settings, programming the Sampler is just a case of ticking **PROGRAM SETTINGS** and checking / amending the Program Options as required.

Programming Procedure

Press the **SET PROG** button to get into the Programming Mode. The following table lists display readouts in bold capitals (Where there is an alternative, this is shown in []), with identification codes in *ITALIC* capitals to help you navigate your way through your particular Program, together with instructions, a few words of explanation, application examples etc... Check through each as appropriate and you will have installed a Program in your Sampler, which meets your exact requirements.

INDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>SETPROG</i> <i>01</i>	SELECT MODE PROGRAM SETTINGS [SYSTEM SETTINGS]	* Select SYSTEM SETTINGS initially. In future you would select PROGRAM SETTINGS unless you wished to change the operating system of the Sampler. If SYSTEM SETTINGS , see <i>SYS01</i> . If PROGRAM SETTINGS , see <i>PROGSAM01</i> .

System Settings - General

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
SYS01	SELECT LANGUAGE ENGLISH [OTHER LANGUAGES]	* Select the language of your choice. Now see SYS02.
SYS02	DATE / TIME 05-07-09 08:30	This is the date / time now. Set the Date / Time taking care to enter 2 digits at each stage. For example enter 05 not 5. Time should rarely need correcting apart from the twice per year daylight saving time shift. Now see SYS03.
SYS03	SAMPLE TEMP LOG NO [YES]	* Sample Temperature Measurement/Logging is available for use with all Stationary Samplers with Single Containers and S300 Series Samplers with Integral Bottlers. Select NO or YES . Now see SYS04.
SYS04	LOW POWER MODE YES [NO]	* When the Sampler is in the low power mode it "goes to sleep" after about 3 minutes with no button pushes. This means that the Display switches off and the system goes into hibernation until called upon to act. To restore normal operation the user just needs to push any button. Continued....



IDENT	DISPLAY SHOWS	ACTION / COMMENTS
SYS04Continued		<p>With Aquacell Stationary Wastewater Samplers LOW POWER MODE is an inconvenience with lit</p> <p>Note: LOW POWER MODE can not be used when the Sampler is programmed in FLOW mode.</p> <p>Note: LOW POWER MODE disables the Sampler Warning Output relay.</p> <p>Now see SYSSAM01.</p>

Systems Settings - Sampler

IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM01	SAMPLER SETTINGS	<p>This screen appears briefly.</p> <p>Now see SYSSAM02.</p>
SYSSAM02	BOTTLER FITTED * YES [NO]	<p>Select YES when the Sampler is to be used with a Bottler.</p> <p>Select NO when the Sampler is to be used with a single Container.</p> <p>Now see SYSSAM03.</p>
SYSSAM03	SHOTS / SAMPLE 01	<p>A Sample is usually a Single Shot Sample, however, there are applications where a 500ml (100ml in the case of the 12 x 0.75 litre Glass Bottler and the 12 x 1 litre PET Bottler) shot of liquid at one time is insufficient for the requirements of the application.</p> <p>Set the number of Shots as appropriate.</p> <p>Continued....</p>



IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM03Continued		<p>Note 1: When Multiple-Shot Sampling is opted for, then every reference to Sample means XX Shots.</p> <p>Note 2: SHOTS / SAMPLE is fixed at 01 for Samplers in PPI Mode</p> <p>Now see SYSSAM04.</p>
SYSSAM04	INITIAL SAMPLE * YES [NO]	<p>You can choose to take a Sample either at the beginning of a Sampling Period or after the first Time Interval / Flow Increment.</p> <p>When the application is to obtain Flow Proportional Samples then the Samples should always be taken after a certain volume of water has passed the Sampling Point and therefore an Initial Sample should not be taken. Where the requirement is to take Samples from a Sampling Point at equal Time Intervals commencing at a certain time then an Initial Sample is sometimes appropriate.</p> <p>Select YES or NO.</p> <p>Now see SYSSAM05.</p>
SYSSAM05	SAMPLING MODE * TIME [FLOW]	<p>Samples can either be taken at fixed Time Intervals or, when coupled to a suitable flowmeter, at equal Flow Increments (see SAMPLING FREQUENCY, page 6.16).</p> <p>Select either TIME or FLOW.</p> <p>If TIME see SYSSAM08.</p> <p>If FLOW see SYSSAM06.</p>

IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM06	FLOW O/R TIME DISABLED (ENABLED) *	<p>When operating in Sampling Mode / Flow, a Flow Override Time can be set. In this way, should a flow related Sample not be called for, after the Override Time has elapsed, then a Sample would be taken regardless of flow. Thus, during periods of low or zero flow, a background Sampling rate is maintained.</p> <p>Select either DISABLED or ENABLED.</p> <p>Now see SYSSAM07.</p>
SYSSAM07	FLOW SIGNAL IMPULSE [4/20mA] *	<p>The Sampler will accommodate either an Impulse Signal (A normally - open, volt-free contact) repeating at equal flow increments, or a 4/20mA Signal corresponding to flow rate.</p> <p>Select either IMPULSE or 4/20mA.</p> <p>Now see SYSSAM08.</p>
SYSSAM08	REMOTE CONTROL YES [NO] *	<p>The Sampling Routine can be inhibited / enabled by an External Signal (see SYSSAM09 for details). Select YES or NO.</p> <p>If YES see SYSSAM09.</p> <p>if NO see SYSSAM11</p> <p>or</p> <p>SYSSAM13 if a Bottler is present.</p>

IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM09	CONTROL MODE * SAMPLER ENABLE [PUMP/TIME TRIG]	<p>With SAMPLER ENABLE selected the Sampler will remain dormant during its Sampling Period until the External Signal appears (or, if an Initial Delay has been selected [see SYSSAM10 for details], until the External Signal has been present for the period of the Initial Delay). EXAMPLE – We only want to take Samples during the Sampling Period, when the pump discharging the effluent is running.</p> <p>With PUMP / TIME TRIG selected the Sampler will take Time Interval Samples, which can be temporarily inhibited by a signal from the pump which is generating the wastewater flow.</p> <p>The method of operation is as follows: The Sampler will take Time Interval Samples (after the Initial Delay, if appropriate) as long as the Effluent Pump is running. If the Effluent Pump has stopped at the time the Sample is due, a Sample is not attempted.</p> <p>If the Pump then re-commences during the ensuing time interval, the Sampler will take a Sample at the point of switch on (or, if an Initial Delay has been selected, after the Pump has been running for the period of the Initial Delay).</p> <p>Continued....</p>

IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM09continued		<p>The next Sample will then be taken at the end of the programmed interval (provided the Pump is running).</p> <p>Provided the Pump operates for some period (longer than the Initial Delay if appropriate) during the interval between Samples, then the Sampler will extract the number of samples expected, consistent with the programmed interval.</p> <p>Note: PUMP/TIME TRIG can not be used when the Sampler is programmed in FLOW mode, and the bottom line of the display will show SAMPLER ENABLE.</p> <p>Select SAMPLER ENABLE or PUMP / TIME TRIG as applicable.</p> <p>Now see SYSSAM10.</p>
SYSSAM10	INITIAL DELAY 00 HOURS 00 MINS	<p>A delay can be programmed in the Samplers recognition of the External Signal. This delay is typically used when a Pump is providing the control signal, to allow the Pump to establish a representative flow.</p> <p>Set time.</p> <p>Now see SYSSAM11.</p> <p>or SYSSAM13 if a Bottler is included.</p>
SYSSAM11	OVERFILL PROT YES [NO]	<p>* The number of samples can be limited, when using a Single Container, to avoid overfilling.</p> <p>Select YES or NO.</p> <p>If YES, see SYSSAM12.</p> <p>If NO, see SYSSAM 13.</p>

IDENT	DISPLAY SHOW	ACTION / COMMENTS
SYSSAM12	MAXIMUM SAMPLES 0050	Set a limit to the number of samples deposited in the Single Container. Now see SYSSAM13.
SYSSAM13	PRE PURGE 03 SECONDS	See Setting the Purge Times page 6.10. Set time. Note: PRE PURGE is fixed at 04 SECONDS for Samplers in PPI Mode Now see SYSSAM14.
SYSSAM14	POST PURGE 06 SECONDS	See Setting the Purge Times page 6.10. Set time. Note: PRE PURGE is fixed at 10 SECONDS for Samplers in PPI Mode Now see SYSINST01 (or SYSBOT1 if a Bottler is included).
SYSINST01	SYSTEM SETTINGS INSTALLED	This screen appears briefly. Now see SETPROG 01

This completes the programming of the Samplers Operating System, when programmed to operate without a Bottler.

If a Bottler is included then continue as follows:

System Settings - Bottler

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>SYSBOT01</i>	BOTTLER SETTINGS	This screen appears briefly. Now see <i>SYSBOT02</i>
<i>SYSBOT02</i>	BOT LOCATIONS * 24 [other bottle location number selections]	Set according to Bottler format. Now see <i>SYSBOT03</i> .
<i>SYSBOT03</i>	RE-CYCLE * YES [NO]	Bottler can either stop on the last Bottle, or continue on to Bottle 1 and repeat its cycle continuously. Select YES or NO . Now see <i>SYSBOT04</i> .
<i>SYSBOT04</i>	BOTTLER MODE * SINGLE [GROUP]	In SINGLE mode each bottle is addressed individually according to the Program selected. In GROUP mode a nominally identical sample is deposited into each bottle of a group simultaneously ^[1] - Perhaps a bottle for each interested party, or possibly a separate bottle for each determinant. (Necessary where preservative dosing of the sample is required, for example.) Note: BOTTLER MODE is fixed at SINGLE for Samplers in PPI Mode Select SINGLE or GROUP . If SINGLE see <i>SYSBOT08</i> If GROUP see <i>SYSBOT05</i>

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
SYSBOT05	BOTTLES/GROUP 2 [other group sizes]	* Select the number of Bottles to be addressed simultaneously ^[1] This number must be less than or equal to the number of bottle locations. Now see <i>SYSBOT07</i> or <i>SYSBOT06</i> , if SHOTS / BOTTLE has been set to YES at <i>SPECOP3</i>
SYSBOT06	BOTTLE = 01 SHOTS = 02	* Select the Bottle Number and then input a 2 digit number using the 0 – 9 Buttons. This Screen allows selection of the number of Shots to be deposited into each Bottle of the Bottle Group. Now see <i>SYSBOT07</i>
SYSBOT07	BOT 15 SEC PAUS NO (YES)	* When carrying out a Group Sample the Bottler moves from one Bottle in the Group to the next as quickly as the Sampler is able to take the individual Samples of the Sample Event. The Bottler Distributor Pipe can be made to dwell over each bottle for 15 seconds after a Sample has been discharged, to allow any remaining drips to drop into the Bottle. Select YES if this feature is required. Now see <i>SYSBOT08</i>

[1] Samples are actually deposited into each Bottle in a Group successively but the time delay between each deposition is only the Sample Cycle Time (seconds) and hence in many cases Samples can be regarded as being taken simultaneously.



IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>SYSBOT08</i>	INCREMENT BY TIME [SAMPLES] *	<p>The Bottler can be programmed to move from one Bottle to the next (or one Group to the next if Bottler is in GROUP mode) either at regular time intervals or after a fixed number of Samples.</p> <p>Select TIME or SAMPLES.</p> <p>If TIME and SAMPLING MODE is set to FLOW,at <i>SYSSAM05</i> see <i>SYSBOT09</i>.</p> <p>If TIME and SAMPLING MODE is set to TIME,at <i>SYSSAM05</i> see <i>SYSINST01</i>.</p> <p>If SAMPLES see <i>SYSINST01</i>.</p>
<i>SYSBOT09</i>	MAX SAMPS / BOTTLE 0007	<p>Set the limit to the number of Samples able to be deposited in each Bottle. Further Samples are inhibited until the Bottler advances to the next Bottle.</p> <p>Now see <i>SYSINST01</i>.</p>
<i>SYSINST01</i>	SYSTEM SETTINGS INSTALLED	<p>This screen appears briefly.</p> <p>Now see <i>SETPROG01</i></p>

This completes the programming of the Samplers Operating System when programmed to operate with a Bottler.



Having programmed the Sampler's operating system, the next thing to do is to program the Sampler to carry out the particular duty required, so the PROGRAM SETTINGS must be determined. Now proceed as follows:

Program Settings - Sampler

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>PROGSAM01</i>	SAMPLER SETTINGS	This screen appears briefly. Now see <i>PROGSAM02</i>
<i>PROGSAM02</i>	START ROUTINE * 06-10-00 08:15 [IMMEDIATELY]	Set a date / time for the Sample Routine to commence, or select IMMEDIATELY . If IMMEDIATELY is selected the Sample Routine will start at the time the RUN PROG Button is pressed. Now see <i>PROGSAM03</i> .
<i>PROGSAM03</i>	STOP ROUTINE * 06-10-00 17:15 [NON STOP]	Set a date / time for the Sample Routine to stop, or select NON STOP . If the time between START ROUTINE and STOP ROUTINE is less than 24 hours, see <i>PROGSAM04</i> . If the time between START ROUTINE and STOP ROUTINE is greater than 24 hours and SAMPLING MODE / TIME at <i>SYSSAM05</i> is selected, see <i>PROGSAM05</i> If the time between START ROUTINE and STOP ROUTINE is greater than 24 hours and SAMPLING MODE / FLOW at <i>SYSSAM05</i> is selected, see <i>PROGSAM06</i>

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>PROGSAM04</i>	REPEAT DAILY * YES [NO]	<p>If the duration of the Sampling Routine is less than 24 hours it can be repeated daily if required. Select YES or NO.</p> <p>Now either see <i>PROGSAM4</i> if SAMPLING MODE, TIME selected, <i>PROGSAM5</i> if SAMPLING MODE, FLOW / IMPULSE selected, or <i>PROGSAM6</i> if SAMPLING MODE, FLOW / 4-20mA selected.</p>
<i>PROGSAM05</i>	SAMPLE INTERVAL 01 HOURS 00 MINS	<p>Set time^[1]. Now see <i>DEFAULT DISPLAY</i> if Sampler is programmed to operate without a Bottler. If Sampler is programmed to operate with a Bottler, either see <i>PROGBOT1</i> if INCREMENT BY SAMPLES is programmed, or <i>PROGBOT2</i> if INCREMENT BY TIME is programmed.</p>
<i>PROGSAM06</i>	FLOW O/R TIME 01 HOURS 00 MINS	<p>Set Flow Override Time to take effect at low flows</p> <p>If FLOW SIGNAL / IMPULSE at <i>SYSSAM07</i> is selected, see <i>PROGSAM07</i></p> <p>If FLOW SIGNAL / 4 / 20mA at <i>SYSSAM07</i> is selected, see <i>PROGSAM08</i></p>

[1] When using the PPI the minimum time permissible is 2 minutes

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>PROGSAM07</i>	IMPs PER SAMPLE 0001	<p>Set number of impulses.</p> <p>If the Sampler is programmed to operate without a Bottler, see <i>DEFAULT DISPLAY</i>.</p> <p>If the Sampler is programmed to operate with a Bottler and INCREMENT BY / SAMPLES is selected, see <i>PROGBOT02</i></p> <p>If the Sampler is programmed to operate with a Bottler and INCREMENT BY / TIME is selected, see <i>PROGBOT03</i></p>
<i>PROGSAM08</i>	INTERVAL AT F.S. 010 MINS	<p>Set interval between Sample Shots at full scale flow i.e. when current signal is 20mA. Note: Interval at half scale (12mA) would be twice that at full scale.</p> <p>If the Sampler is programmed to operate without a Bottler, see <i>PROGINST01</i></p> <p>If the Sampler is programmed to operate with a Bottler, see <i>PROGBOT01</i></p>
<i>PROGINST 01</i>	PROGRAM INSTALLED	<p>This Screen appears briefly.</p> <p>Now see the <i>DEFAULT DISPLAY</i></p>

This completes the Program installation when the Sampler is programmed to operate without a Bottler.



If a Bottler is included then continue as follows:

Program Settings - Bottler

IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>PROGBOT01</i>	BOTTLER SETTINGS	This Screen appears briefly. If the Sampler is programmed to operate with a Bottler and INCREMENT BY / SAMPLES is selected, see <i>PROGBOT02</i> If the Sampler is programmed to operate with a Bottler and INCREMENT BY / TIME is selected, see <i>PROGBOT03</i>
<i>PROGBOT02</i>	SAMPLES PER BOTTLE 002	Select the number of Samples to be deposited into a Bottle before the Bottler indexes to the next Bottle (or next Group if the Bottler is in GROUP MODE). Now see the <i>PROGINST01</i>
<i>PROGBOT03</i>	TIME PER BOTTLE 00 HOURS 30 MINS	Select the time that Samples are to be deposited into a Bottle before the Bottler indexes to the next Bottle (or next Group if the Bottler is in GROUP MODE). Now see <i>PROGINST01</i> .
<i>PROGINST01</i>	PROGRAM INSTALLED	This screen appears briefly. Now see the DEFAULT DISPLAY

This completes the Program Installation when the Sampler is programmed to operate with a Bottler.

Special Options

An additional menu of System Options is available for functions which are only required for specialised applications. This menu can only be accessed when the Screen shows the DEFAULT DISPLAY

To enter the **SPECIAL OPTIONS** Menu press and hold the * button for at least 2 seconds then release and briefly press the ✓ button.



IDENT	DISPLAY SHOWS	ACTION / COMMENTS
<i>SPECOP1</i>	SPECIAL OPTIONS * YES [EXIT]	Select YES to see options available or EXIT to return to <i>DEFAULT DISPLAY</i> . If YES see <i>SPECOP 02</i> If EXIT see <i>DEFAULT DISPLAY</i>
<i>SPECOP2</i>	AUTO RESTART * NO [YES]	The Sampler can be made to automatically restart its program after a power interruption. (This option is not available when a Bottler is connected). Select YES or NO . Now see <i>SPECOP 3</i> .
<i>SPECOP3</i>	SHOTS / BOTTLE * NO [YES]	The Sampler can be made to deposit individually designated numbers of Sample Shots into each bottle of a bottle array when in GROUP mode. Select YES or NO . Now see <i>SPECOP 4</i> .
<i>SPECOP4</i>	RELAY OUTPUT * SAMPLE AQUIRED [DURING SHOT]	The Sample Acquired Relay Output can be reprogrammed to close for the duration of the Sample Shot. Select SAMPLE ACQUIRED or DURING SHOT . Now see <i>SPECOP 1</i> .

Special Options Indication

Having selected one or more of the 3 available Special Options the *DEFAULT DISPLAY* Screen will show a 3-digit Code positioned at the bottom left of the Display. The digits show 0 for Option not selected and 1 for Option selected (choice in []), for *SPECOP2*, *SPECOP3* and *SPECOP4* respectively.

Example: *DEFAULT DISPLAY* shows **010** at the bottom left of the Screen. This means that *SPECOP3* has been programmed.



Running the Program

Press the RUN PROG Button. First the Sampler's Data Logger will be wiped clean and then the Sample Shot Counter will be reset to zero. The selected PROGRAM will then be executed. The Bottler (if fitted) will first move to the Bottle 1 Position and the Display will show:

TESTING BOTTLER PLEASE WAIT

The Display will then cycle continuously through the "Program Running – Status" Displays appropriate to the Sampler / Bottler / Program configuration, typically as follows:

IDENT	DISPLAY SHOWS	COMMENTS
DISPLAY A	PROGRAM RUNNING 01-02-08 11:24	Shows status of sampler and provides a date / time check.
DISPLAY B	NEXT SAMPLE DUE 00Hr 15Min 25Sec	Provides an indication of when the next sample can be expected.
DISPLAY C	BOTTLER INC. IN 00Hr 05Min 25Sec	DISPLAY C only appears when the Sampler is used with a Bottler and INCREMENT BY TIME (SYSBOT 5) has been selected. Provides an indication of when the next bottle (or group of bottles when BOTTLER MODE, GROUP is selected) will be addressed.

In addition to the above Status Displays the Screen will also display Warning Event Messages relating to any Warning Events which have occurred during the Program. The Screen will initially show the specific Warning event, when it occurs, between the other "Program Running – Status Displays". Subsequently the Warning Event Message will be substituted with the following Display:

WARNING OCCURED PRESS VIEW

This invites the user to interrogate the Sampler's Log to examine the Warning Events.



When the Program has completed the Display will usually show:

**PROGRAM
COMPLETE**

Note

When **OVERFILL PROTECTION** has been selected and the PROGRAM has been terminated by the chosen limit having been reached, then the Display will show:

**MAXIMUM SAMPLES
REACHED**

Taking Spot Samples During a Sampling Program

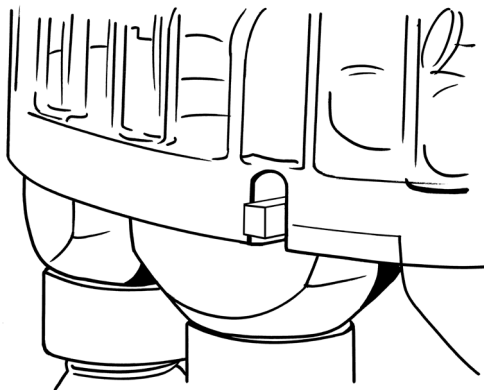
Often a Spot Sample is required at a particular time as witness to a particular Flow Event for example, and this is easy to do even when the Sampler is in the middle of a SAMPLE ROUTINE. Simply check the Display to ensure that a programmed Sample is not about to be taken, exchange the Sample Collection Vessel for a temporary substitute one and press the **SPOT SAMPLE** Button. The Sampler will discharge the Spot Sample into the substitute vessel and then continue its Program. If an Automatic Sample happened to be called upon during this event then the Sample would simply be delayed until the Spot Sample had been completed, which should be long enough to replace the original Sample Collection Vessel.

Bottlers

Detachable Bottlers

All Aquamatic Detachable Bottlers comprise a Distributor Unit characterised by its transparent Distributor Dome, a Distributor Pipe and a Bottle Carrier. It is most important when locating the Distributor unit on the Bottle Carrier that the Polarising Slot in the Distributor Dome engages with the corresponding peg on the Bottle Carrier. See illustration.

When using one of the two 12 Bottle Bottlers it should be noted that there is an upper limit on Sample Shot Volume of approximately 100ml. This is imposed by the rate at which the Distribution Tray is able to disperse the water into the Bottle.



Self-Emptying Bottler

The Self-Emptying Bottler operates in a similar way to the standard Bottler except that it drives at a much slower rate (time to complete the full 360 degrees is about 75 seconds). As the Distributor Pipe moves round it causes the two 4.5 litre containers to tip out their contents in turn. The tipped Samples are fed down a Gravity Drain to waste.

A typical requirement for the Self-Emptying Bottler is to collect 24-hour Composite Samples in each container in turn, disposing of the next container's contents immediately before commencing the next Composite Sample. In this way "yesterday's sample" is always available. The following abbreviated example Program should achieve this requirement:

SAMPLING MODE TIME
BOTTLE LOCATIONS 2
RECYCLE YES
BOTTLER MODE SINGLE
INCREMENT BY TIME
SAMPLE INTERVAL 01HOURS 00MINS
TIME PER BOTTLE 24HOURS 00MINS



Leaving the Sampler to Operate Automatically

- Ensure that the Sample Collection Vessel(s) is (are) clean and dry.
- Locate the Sample Collection Vessel taking care to ensure that the Samplers Pinch Valve Tube (the Sample Discharge Point) is properly located in the Collection Vessel point of entry.
- Switch on the power.
- Program the Sampler as required.
- Take a few Spot Samples to verify operation (you may wish to use a substitute Sample Collection Vessel to collect these samples in order not to contaminate the Sample Collection Vessel(s) to be used for the sample program).
- Press the **RUN PROG** button.
- Close and secure the Front Cover / Door as appropriate.
- Leave the Sampler to extract its Programmed Samples.
- NB You may find the Test Mode (page 7.5) useful when setting up the Sampler).

Returning to Collect Samples

- Open the Front Cover / Door.
- Press the **VIEW PROGRAM** Button to check the Sampler's movements.
- Press the **STOP** Button.
- Remove the Sample Collection Vessel(s).
- Either decant the Samples into separate containers or retrieve the charged Sample Collection Vessel(s) intact as required. NOTE (Samplers incorporating Sample Temperature Control) Provision should be made to maintain Samples at a nominal 4°C during transportation back to the laboratory.



Data Logging / Communication Facilities

It is often useful to take a retrospective look at the Samplers behaviour, after a period of operation. All Aquacell Samplers have on-board Logging Facilities. Logged data is divided between Sampling / Warning Events and (optional) Sample Temperature Readings.

The Logger can be interrogated using the Sampler's Keypad / Display (See Viewing the Program Settings and Progress, page 6.51). Sample Event / Warning Event data is available. Where the Sampler is supplied with the Sample Temperature Monitoring Facility, Sample Temperature statistics are also available (Max, Min, Mean and Present Sample Temperatures).

When the Sampler is specified with the Data Connection, there is a choice of either interrogating the logger using the Sampler's Keypad / Display, or downloading the data to a computer. When downloading the data to a computer, the Sample Temperature Data (where the Sample Temperature Monitoring Facility is present) are available in full. See page 6.55 for details on setting up to download the logger to a computer.

Sample Events and Warning Events are logged from when the RUN PROG Button is pressed until the STOP Button is pressed (or the Logger reaches its capacity). This period is known as the Event Logging Phase.

The Event Logger will store up to 1012 Sampling / Warning Events. When the Event Logger reaches its capacity, it will cease to acquire any further data.

Sample Temperature Monitoring (Option)

Sample Temperature Readings are taken using a Temperature Probe. The Probe is inserted into the Sample Container (Samplers with a Single Container) or one of the Sample Bottles (S300 Series Samplers with the Integral Bottler option, only).

The Sample Temperature Logger will store up to 42 days of 5 minute interval, Sample Temperature Readings. When the Sample Temperature logger reaches its capacity, it will cease to acquire any further data.

Sample Temperature readings are logged at intervals of 5 minutes, starting, during a Sample Program, after the first Sample is taken, and finishing when the STOP button is pressed (or the logger reaches its capacity).

The entire logger is cleared when the RUN PROG button is pressed, to initiate a Sample Program.

Sampling Events

Sampling Events are the events carried out by the Sampler and its peripherals, during normal operation. Sampling Events that can be recognised by the Sampler are shown in the following table, together with the Sampler's response:

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	SAMPLER'S RESPONSE / NOTES
SE01	INITIALISING	PRG START	The RUN PROG Button has been pressed.	The Sample Program commences and the Display goes into the Program Running status (after showing INITIALISING briefly).
SE02		SAMPLE OK	A Sample has been acquired..	The Sample Routine has completed successfully.
SE03		REM I/P ON	The Remote Control Input has been switched on.	
SE04		REM I/P OFF	The Remote Control Input has been switched off.	

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	SAMPLER'S RESPONSE / NOTES
SE05	INC BOTTLER	INC BOTTLER	The Bottler Distributor Arm is moving to its next programmed position.	The Display shows INC BOTTLER whilst the bottler is incrementing and then returns to the status it was in prior to the INC BOTTLER event.
SE06	PROGRAM COMPLETE	PRG COMPLET	The Sample Program has completed.	The Display shows PROGRAM COMPLETE and no further programmed Sampling Events can occur. Further SPOT Samples are permitted. Event and Temperature Logging continues until the STOP Button is pressed.
SE07	STOP BUTTON PRESSED	STOPPED	The STOP Button has been pressed during or after a Sample Program.	The Display shows STOP BUTTON PRESSED (regardless of what the Display was previously showing). Pressing the STOP Button a second time makes the Display revert to the Standby Display.

Warning Events

Warning Events are uncommon events, carried out by the Sampler and its peripherals. Warning Events that can be recognised by the Sampler are shown in the following table, together with the Sampler's response:

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE01	SHOT TIMED OUT	SHT T/OUT	The Sample Chamber Electrodes were not bridged by wastewater after a 68 sec intake phase.	YES	NO	Tested when a sample was attempted.
WE02	GUARD ELECTRODE HIT	GUARD HIT	The Short (Guard) Electrode was hit before the Long Electrode.	NO	NO	Tested when a sample was attempted.
WE03	ELECTRODE OPEN CIRCUIT	OPEN CCT	One or more Sample Chamber Electrodes / contact springs, failed to connect.	YES	NO	Tested when the RUN PROG Button was pressed and when a Sample was attempted.
WE4	ELECTRODES SHORT CIRCUIT	SHORT CCT	A conduction path existed between the Sample Chamber Electrodes.	YES	NO	Tested when the RUN PROG Button was pressed and when a Sample was attempted.

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE5	MAXIMUM SAMPLES REACHED	MAX SAMPS	The sample count reached, that which had been programmed as a maximum permitted (to avoid the Sample Collection vessel overflowing).	YES	YES	Tested when a Sample was attempted.
WE6	FAULT BOTTLER FITTED	BOT FITTED	With the Sampler programmed to operate without a Bottler, an attempt to detect a Bottler found a Bottler to be fitted (i.e. a fault condition).	N/A	YES	Tested when the RUN PROG Button was pressed.
WE7	FAULT BOTTLER MISSING	BOT MISSING	With the Sampler programmed to operate with a Bottler, an attempt to exercise the Bottler failed.	N/A	YES	Tested when RUN PROG was pressed.
WE8	BOTTLER FAULT	BOT X	The Bottler failed to increment.	N/A	YES	Tested when a Bottler increment was attempted.

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE9	SAMPLE TEMP SENSOR FAULT	ST SNSR X	With the Sampler programmed to measure / log Sample Temperature, the Sample Temperature Sensor was either missing or faulty.	N/A	NO	This Warning Event only applies to Samplers fitted with the (Optional) Sample Temperature Monitoring feature. Tested continuously.
WE10 ²	PLANT ZONE TEMP SENSOR FAULT	PZT SNSR X	The Plant Zone Temperature Sensor was either missing or faulty	N/A	NO	This Warning Event only applies to Models S310H, and S320H (i.e. when the Plant Zone Temperature Sensor has been factory programmed to be active). Tested continuously.

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE ¹¹²	CONTAINER ZONE TEMP SENSOR FAULT	CZT SNSR X	The Container Zone Temperature Sensor was either missing or faulty.	N/A	NO	This Warning Event only applies to Models S310H, S320 and S320H (i.e. when the Container Zone Temperature Sensor has been factory programmed to be present). Tested continuously.
WE ¹²²	EVAP PLATE TEMP SENSOR FAULT	EPT SNSR X	The Evaporator Plate Temperature Sensor was either missing or faulty.	N/A	NO	This Warning Event only applies to Models S320 and S320H (i.e. when the Evaporator Plate Temperature Sensor has been factory programmed to be present). Tested continuously.

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE13 ²	DEFROST TIME OUT	DFRST T/OUT	The evaporator plate failed to reach 3°C during a defrost cycle.	N/A	NO	This Warning Event only applies to Models S320 and S320H (i.e. when the Evaporator Plate Temperature Sensor has been factory programmed to be present)..
WE14 ²	CONTAINER ZONE TEMP OUT OF RANGE	CZ TEMP OUT	The Container Zone temperature was out of the 0 -5°C window permitted (or below 0°C in the case of S310H).	N/A	NO	This Warning Event only applies to Models S310H, S320 and S320H Tested continuously from when RUN PROG was pressed, except, during Defrost Cycles and for a period of 10 minutes thereafter

IDENT	DISPLAY SHOWS	LOG SHORT FORM	EVENT	ABORT SHOT	ABORT PROG ¹	NOTES
WE15 ²	CONTAINER ZONE TEMP IN RANGE	CZ TEMP IN	The Container Zone temperature was within the 0 -5°C window permitted (or above 0°C in the case of S310H)	N/A	NO	This Warning Event only applies to Models S310H, S320 and S320H Tested continuously from when RUN PROG was pressed, except, during Defrost Cycles and for a period of 10 minutes thereafter
WE16	SUPPLY VOLTAGE LOW	LOW VOLTS	The supply voltage fell below the minimum permitted	YES	YES	Tested continuously

Notes

1. If a Sample Program is in progress at the time
2. These Warning Events only apply to S300 Series Sampler Models

Warning Event occurrences, out of the Event Logging Phase

1. The Display reverts to the read-out, appropriate to the Warning Event as shown in the table above, for 4 seconds, and then returns to the Default Display
2. The (Optional) Sampler Warning Output is activated for 4 seconds, and then is de-activated
3. The (Optional) Beacon (Red Segment) flashes, for 4 seconds, and then stops

Warning Event occurrences during the Event Logging Phase

1. The Display reverts to the read-out appropriate to the Warning Event as shown in the table above for 4 seconds. It then returns to the display / displays, showing when the Warning Event occurred, but now it alternates with the Warning Occurred / Press View Display. The Display cycles through (for example):-

Display 1

PROGRAM RUNNING
12-12-08 13:14

Display 2

NEXT SAMPLE DUE
00Hr 50Min 30Sec

Display 3

WARNING OCCURRED
PRESS VIEW

Display 1 etc.

2. The (Optional) Sampler Warning Output is activated.
3. The (Optional) Beacon (Red Segment) flashes.

In addition the event is logged

Note: When a Warning Event occurs during the Event Logging Phase, it is likely that the Sampler is unattended and the **WARNING OCCURRED / PRESS VIEW** display combined with the optional, Warning Output and / or flashing Beacon serve to alert the operator that a Warning event has occurred and invite him to view the details.

Pressing the **VIEW** Button takes the Sampler out of the Warning Status:

1. The Display returns to it's status before the Warning Event occurred
2. The (Optional) Sampler Warning Output is de-activated.
3. The (Optional) Beacon (Red Segment) stops flashing.

When a Warning Event has occurred during a Sample Program and has been acknowledged by pressing the VIEW Button, the (Optional) Beacon (Red Segment) will STOP flashing. It will flash again when the the STOP Button is pressed.

Warning Event occurrences whilst a Spot Sample is being taken, during the Event Logging Phase

1. The Display reverts to the read-out, appropriate to the Warning Event as shown in the table above, for 4 seconds, and then returns to the Default Display
2. The (Optional) Sampler Warning Output is activated for 4 seconds, and then is de-activated
3. The (Optional) Beacon (Red Segment) flashes, for 4 seconds, and then stops

In this case the event is not logged

Viewing the Program Settings and Progress

To assess the Sample Program you have entered, or its progress, either before running it, whilst it is running or after it has completed, press the **VIEW** button. The display will show as follows:

VIEW*
PROG SETTINGS
(SHOT PROGRESS)
(SAMPLE TEMP)
(WARNING LOG)
(SAMP/WARNING LOG)



Select **PROG SETTINGS, SHOT PROGRESS, SAMPLE TEMP**
(Note: This menu choice is only available if the Sampler is fitted with the Sample Temperature Monitoring Facility – Stationary, and the facility is enabled [See SYS4]), **WARNING LOG** or **SAMP/WARNING LOG** as required and press the ✓ button. Now observe the following Displays:

If **VIEW / PROG SETTINGS** is selected-

The Display will cycle, showing in turn - Start and Stop times, Frequency of Sampling and Frequency of Bottler Incrementation (if a Bottler is fitted) and then return to the status it was in, prior to the VIEW button being pressed - For example:

**START SAMPLING
IMMEDIATELY**

**STOP SAMPLING
NON STOP**

**SAMPLE INTERVAL
00HOURS 30MINS**

**SAMPs/BOTTLE
001**

**SAMPLER
READY**

If **VIEW / SHOT PROGRESS** is selected-

The Display will cycle, showing in turn - the number of Shots attempted / completed, and then return to the status it was in, prior to the VIEW Button being pressed. For example:

**SHOTS ATTEMPTED
00050**

**SHOTS COMPLETED
00050**

**SAMPLER
READY**



If **VIEW / SAMPLE TEMP** is selected-

The Display will cycle, showing in turn - Maximum Sample Temperature, Minimum Sample Temperature, Mean Sample Temperature and Present Sample Temperature and then return to the status it was in, prior to the **VIEW** button being pressed. For example:

**MAX SAMPLE
TEMP = 4.5°C**

**MIN SAMPLE
TEMP = 2.0°C**

**MEAN SAMPLE
TEMP = 3.5°C**

**PRESENT SAMPLE
TEMP = 4.0°C**

**SAMPLER
READY**

Note: Maximum Sample Temperature, Minimum Sample Temperature and Mean Sample Temperature are computed from data collected from the time the first sample is taken, until the time the **STOP** Button is pressed (or the data logger is full).

If **VIEW / WARNING LOG** is selected-

The first Warning Event to occur (If any Warning Events have occurred), between pressing the **RUN PROG** Button and pressing the **STOP** Button, will appear on the Display - see below. Press the **▼** button, to view any other Warning Events which may have occurred.

The top line of the Display will show: Event Serial Number (Warning Events are counted along with Sampling Events) and the Log Short Form. The corresponding date and time when the Warning Event occurred are shown on the bottom line of the display followed by **◆**. For example:

**0025 GUARD HIT
10-12-08 17:41◆**

If no Warning Events have occurred the display will show:

NO WARNINGS

Holding the ▼ Button pressed, instead of repeatedly pushing it, will cause the log to step once per second for the first 5 seconds. Holding the ▼ Button down for longer than 5 seconds will cause the Log step rate to increase to 10 per second.

The ▲ button can be used in the same way as the ▼ button but to step backwards through the log. If the ▲ button is pressed at the start of a View routine the Log will display the last Log Entry

If **VIEW / SAMP/WARNING LOG** is selected-

The first Sampling Event to occur, between pressing the RUN PROG Button and pressing the STOP Button, will appear on the display - see below. Press the ▼ button, to view any other Sampling Events / Warning Events which may have occurred.

The top line of the display will show: Event Serial Number and the Log Short Form. The corresponding date and time when the Warning Event occurred are shown on the bottom line of the display followed by ♦ For example:

```

0001 PRG STARTED
10-12-08    17:41 ♦

0002 SAMPLE OK
10-12-08    17:42 ♦
  
```

Holding the ▼ Button pressed, instead of repeatedly pushing it, will cause the Log to step once per second for the first 5 seconds. Holding the button down for longer than 5 seconds will cause the Log step rate to increase to 10 per second.

The ▲ button can be used in the same way as the ▼ button but to step backwards through the log. If the ▲ Button is pressed at the start of a View Routine the Log will display the last Log Entry

Escaping from the VIEW status

- Press the **VIEW** Button a second time.
- If no button pushes are made for a period of 20 seconds the display reverts automatically to the status it was in before the VIEW Button was pressed initially.
- If a sample becomes due, during a **VIEW** routine, the Sampler will temporarily exit the **VIEW** status, whilst the sample is taken, and subsequently return.

- Pressing the **STOP** Button twice causes the Sampler to escape both the **VIEW** status and the Warning Status. It also aborts the Sample Program. The Display returns to the **DEFAULT DISPLAY**

Downloading the Samplers Event and Sample Temperature logs to a Computer

(Only applies to Samplers supplied with the Data Connection)

The following assumes that the computer is programmed with, either Microsoft™ Windows 95, Microsoft™ Windows 98, Microsoft™ Windows 2000, or Microsoft™ Windows XP, Microsoft™ Windows Vista, or Microsoft™ Windows 7 and Microsoft™ Hyper Terminal.

This procedure illustrates how data is transferred from the Sampler to the computer using Hyper Terminal and subsequently captured in a text (.txt) file, for future reference.

Initial Preparations

Ensure the Sampler is not in the "Low Power Mode" (See page 6.21)

Connect the USB cable (supplied) between a USB port on the computer and the Optional Data Connection, on the Front Panel of the Sampler Module.

In order for your Aquacell Sampler to communicate with your PC it is necessary to setup the appropriate interface drivers. This is a two stage process and is carried out as follows:

Stage 1

- The "New Hardware Found" balloon message will pop up in the Tool Tray
- The "Found New Hardware Wizard" window will open
- Click the "Yes this time only" radio button
- Click "Next"
- The next "Found New Hardware Wizard" window will open
- Click "Install software automatically" radio button
- Click "Next"
- The "USB Serial Converter" will now be installed. NOTE this may take a few minutes, do not unplug the sampler whilst this is being carried out

- Click "Finish" when conformation of the installation is shown

Stage 2

- The "New Hardware Found" balloon message will pop up in the Tool Tray
- The "Found New Hardware Wizard" window will open
- Click the "Yes this time only" radio button
- Click "Next"
- The next "Found New Hardware Wizard" window will open
- Click "Install software automatically" radio button
- Click "Next"
- The "USB Serial Port" driver will now be installed. NOTE this may take a few minutes, do not unplug the sampler whilst this is being carried out
- Click "Finish" when conformation of the installtion is shown

Your Aquacell Sampler is now ready to communicate with your PC

Configuring a Hyper Terminal Connection

- Open Hyper Terminal (This is usually accessed from the "Start" button via All Programs / Accessories / Communications / Hyper Terminal).
- The "New Connection – Hyper Terminal" window opens with "Connection Description" window on top. This is inviting you to configure the connection.
- Enter a file name of your choice (e.g. Aquacell), and select an icon, in the "Connection Description" screen to enable Windows to identify the Aquacell connection configuration.
- Press OK.
- The "Aquacell (or your chosen name) - Hyper Terminal" window opens with the "Connect To" window on top.
- Check the "Connect using" drop-down menu and select the appropriate COM port (The COM port number will relate to the communications port, to which the Sampler is connected, and will not normally be COM 1).
- Press OK.

- The “COM Port Properties” window opens.
- Set “Port Settings” using the drop-down menus as follows:

Bits per second	19200
Data bits	8
Parity	None
Flow control	None
Stop bits	1

- Press OK.

The connection is made and the “Connected” time is displayed at the bottom left of the Hyper Terminal window

Finally amend the ASCII Setup:

- Go to the “ASCII Setup” window via File/Properties/Settings/ASCII Setup
- Tick “Append line feeds to incoming line ends” box.
- Press OK.
- Return to the Aquacell Properties/Settings window
- Press OK
- Click “File / Save as” to open the “Save as...” window.
- Aquacell (or your chosen name) should appear in the “File name” aperture. Use the “Save in” drop – down menu to select a location in your computer where you want to save the Hyper Terminal file.
- Press “Save”

Starting a Hyperterminal Download Session

- Open Hyper Terminal (This is usually accessed from the “Start” button via All Programs / Accessories / Communications / Hyper Terminal).
- The “New Connection – Hyper Terminal” widow opens with the “Connection Description” window on top. This is inviting you to configure the connection.
- As the connection is already configured, click the “Cancel” button on the “Connection Description” window
- Click File/Open

- The “Open” window opens, with the previously configured connection file
- Double click the file to open the connection. (Remember that the sampler must be connected to the same port that it was connected to, when the connection was configured).
- The “Aquacell (or your chosen name) Hyper Terminal” window opens with the “Connected” time displayed at the bottom left of the window.

Giving the Sampler a name

- Type “*s”, followed by the chosen name (up to twenty ASCII characters long), followed by a carriage return.
Example:-
Type “*sSAMPLER 1”, and then press Carriage Return – This gives the Sampler the name SAMPLER 1
- Click the close button on the Hyper Terminal window
- The Hyper Terminal “You are currently connected. Are you sure you want to disconnect now?” window opens on top of the main Hyper Terminal window.
- Press the “Yes” button.
- The Hyper Terminal “Do you want to save the connection named “Aquacell (or your chosen name)?”” window opens on top of the main Hyper Terminal window.
- Press the “Yes” button.

Configuring the text file in which the data will be captured

- Click Transfer / Capture Text to open the “Capture Text” window.
- Click the “Browse” button
- The “Select Capture File” window opens
- Find the folder, in which you intend to store the text file, you are about to create. Give your text file a name – for example, “Sampler 1” and then click the “Save” button.
- The selected file string appears in the aperture in the “Capture Text” window. Click “Start” and you are ready to download data from the Sampler.

Note For subsequent downloads, the selected file string should already be present in the aperture in the "Capture Text" window. If this is the case, just Click "Start"

Downloading the Event Log

- Type "*e", and then press Carriage Return.
- If the logger contains 150 or more Event logs, The Hyper Terminal window on the computer screen shows (example variables are given):

```
*e
Unit = Sampler 123
Date: 28-05-08, Time: 17:16
Sampler firmware: VER 02.07.00BL
EVENT LOG
Record Count = xxxxx
Approximate download time = t1 - t2 secs (or mins, as appropriate)
Press the '1' button on the Sampler to continue with the download
Press the '2' button on the Sampler to abandon the download (Pressing the STOP button at any time during the
download will also cause the download to abort)
The Sampler is waiting for response...
```

- The Samplers LCD shows:
[1] TO DOWNLOAD
[2] TO ABANDON
- Press the 1 button on the Sampler to continue with the download or the 2 button to abandon the download.

Note: If the logger contains less than 150 Event logs, the above choice will not be given and the download will continue.

- The Samplers LCD shows:
DOWNLOADING
When the download is complete, the screen returns to the Default Display.
- The Samplers LCD returns to the Default Display

Downloading the Sample Temperature Log

- Type “*t”, and then press Carriage Return.
- The Hyper Terminal window on the computer screen shows (example variables are given):

```
*t

Unit = Sampler 123

Date: 27-05-08, Time: 17:24

Sampler firmware: VER 02.07.00BL

SAMPLE TEMPERATURE LOG

Temperature Correction = 00.0

Record Count = 00019

Select Download Format...

Format 1) - Press button '1' on the Sampler to select Spread Sheet format.

Format 2) - Press button '2' on the Sampler to select Visual Appraisal format.

NOTE: Temperatures are logged at 5 minute intervals

Press the 'STOP' button on the Sampler to abandon the download.

The Sampler is waiting for response...
```

- The Samplers LCD shows:
'1' FOR FORMAT 1
'2' FOR FORMAT 2
- Press the 1 or 2 button on the Sampler as required, or the STOP button if you wish to abandon the download.

- If Format 1 (the Spread Sheet format) is selected, and the logger contains 150 or more Temperature logs The Hyper Terminal window on the computer screen shows (example variables are given):

Spread Sheet format selected...

Approximate download time = $t_1 - t_2$ secs (or mins as appropriate)

Press the '1' button on the Sampler to continue with the download

Press the '2' button on the Sampler to abandon the download (Pressing the STOP button at any time during the download will also cause the download to abort)

Sampler is waiting for response...

- The Samplers LCD shows:
[1] TO DOWNLOAD
[2] TO ABANDON
- Press the 1 button on the Sampler to continue with the download or the 2 button to abandon the download.

Note: If the logger contains less than 150 Event logs, the above choice will not be given and the download will continue.

- If Format 2 (the Visual Appraisal format) is selected and the logger contains 150 or more Temperature logs, The Hyper Terminal window on the computer screen shows (example variables are given):

Visual Appraisal format selected...

Approximate download time = $t_1 - t_2$ secs (or mins as appropriate)

Press the '1' button on the Sampler to continue with the download

Press the '2' button on the Sampler to abandon the download (Pressing the STOP button at any time during the download will also cause the download to abort)

Sampler is waiting for response...

- The Samplers LCD shows:
[1] TO DOWNLOAD
[2] TO ABANDON
- Press the 1 button on the Sampler to continue with the download or the 2 button to abandon the download.

Note: If the logger contains less than 150 Event logs, the above choice will not be given and the download will continue.

- If the 1 button on the Sampler is pressed, in the case of either Format 1 or Format 2, the Samplers LCD shows:

DOWNLOADING

When the download is complete, the screen returns to the Default Display.

- If the 2 button on the Sampler is pressed, in the case of either Format 1 or Format 2, the download is abandoned and the Samplers LCD returns to the Default Display.

Closing down

- After the download session has been completed you need to close down the text file and the Hyper Terminal connection as follows:
- Click Transfer / Capture Text / Stop on the Hyper Terminal window.
- Click the close button on the Hyper Terminal window
- The Hyper Terminal “You are currently connected. Are you sure you want to disconnect now?” window opens on top of the main Hyper Terminal window.
- Click the “Yes” button.

A Few simple DO'S and DON'TS when operating your Sampler

Do's

1. Do ensure that the plastic surface inside the chamber top, particularly between the electrodes, is kept clean and free from wastewater contamination.
2. Do ensure intake filter is correctly suspended in the water.
3. Do ensure that there are no leaks in Intake Hose joints. Leaks will cause air bubbles to be entrained in the water being drawn up the Intake Hose and, in turn, the samplers lift velocity will be degraded.
4. Do ensure there are no sags in the Intake Hose. - These retain water from previous samples and cause cross contamination of samples.
5. Do check humidity indicator regularly. It is vital that all the electrical parts are kept dry. Always change the Desiccant Bag when 40% circle on indicator turns pink.
6. Do take great care to ensure that sample frequency and size are optimised to provide a true representation of the wastewater flow. Companies can often obtain advice from their local water company particularly where samples are being taken in connection with charge assessment / consent limits.
7. Do disconnect battery (if fitted), if Sampler is not used for prolonged periods, as failure to do so can cause damage to occur.
8. Do keep the sample volume small where a wastewater has the potential to create foam. This has the effect of minimising the time that wastewater is dropping out of the Volume Control Tube and hitting the surface of the wastewater accumulating in the Sample Chamber, (so creating foam), before the Volume Control Tube becomes immersed.

Don'ts

1. Don't leave samples for longer than necessary before analysing them. When the samples are biologically active, the degradation can be minimised by storing them in a refrigerator set to about 4°C.

2. Don't allow the Sampler to cycle more frequently than necessary, particularly at high lifts and / or at high ambient temperature, and don't set unnecessarily long purge times as this will impose unnecessary wear on the pump.
3. Don't allow wastewater to splash the inside of the Sample Chamber top as this will cause the inside of the Chamber Top to build up a layer of wastewater residues. This in turn can lead to PROBE SHORT CCT / GUARD PROBE HIT faults (See page 7.10 , MAINTENANCE). When water enters the chamber erratically it is likely that the intake is not fully immersed. Check and correct if necessary.

7

MAINTENANCE

General

Maintenance Contract

In order to ensure optimum performance and reliability, it is essential that your Aquacell Sampling equipment is maintained correctly. Aquamatic or its distributor, can provide a 12 month Maintenance contract, where regular visits to your site will be carried out, giving you (and any associated regulatory body) the peace of mind that your Sampler is always in good working order. Additionally during these visits, your installation will be checked and the Sampler program will be confirmed as being suitable for your requirements. Please contact Aquamatic or your local distributor, for more details of this service.

User Maintenance

In addition to the above there is the need for routine user maintenance. All models require, the sample tract to be kept clean and the electronic / electrical hardware inside the sealed Sampler Module to be kept dry.

In the case of the S300 samplers, the Intake and Exhaust Vents to the rear of the Sampler Cabinet need to be kept unblocked, particularly the S320 and S320H models where an unimpeded airflow is essential to maintain efficient operation of the cooling system. This is achieved by regularly brushing the flyscreens, to remove any accumulated dust etc. Brushing the Flyscreens can usually be done with the Air Cowls in place, however it may be preferable to remove them, and this is done by removing the M4 pozi headed fixing screws. If a Vent has become badly contaminated, it may be preferable to replace it. The Air Cowl (where fitted) must be removed to access the Vent panel. Before removing the Vent panel, you should switch off the mains power to the Sampler at the main Isolator.

The Vent panel is removed by removing the pozi head screws. The Vent panel should be replaced with, S300, Vent, Intake (Large) Part No. CL-6201^[1] or S300, Vent, Exhaust (Small) Part No. CL6200^[1]

The S320 and S320H models are fitted with a Condensate Drain (Unless a Wastewater Drain is specified). This is terminated in the 22mm O/D pipe stub at the bottom rear of the Sampler Cabinet. Regular checks should be made to ensure that this drain is unblocked, by pouring a small quantity of water into the bottom of the Lower Compartment and ensuring that it flows out of the pipe stub. If a blockage is discovered, steps should be taken to clear it (using a bottle brush or other suitable implement).

Occasionally it may be necessary to lubricate the pinch valve using Pinch Valve Grease Part No. CL-6140^[1] A small deposit of grease is applied to the piston shaft and spread over the working surfaces by manually moving the piston in and out.

It is always a good policy to maintain the Sampler and its accessories in a generally clean condition bearing in mind the potential infection hazards associated with wastewater.

Cleaning The Sample Tract

The method adopted to clean the sample tract will depend on how sensitive the application is to cross contamination.

Most parts of the sample tract are easily accessible and can be cleaned with a detergent and / or a cream cleaner such as "CIF" using a suitable brush.

Inaccessible parts of the sample tract are usually flushed out with clean water. Where the Sampler has to be completely free from the contamination of previous sampling operations then replacement of inaccessible parts is the only option.

The frequency of cleaning will depend very much on the application. Initial operating experience with the Aquacell S50/S100/S200/ S300 Samplers will enable you to decide how frequently the sample tract needs to be cleaned in order to ensure that reliable and representative samples are always available.

[1] Caution - use only genuine Aquamatic parts, otherwise serious damage may result.

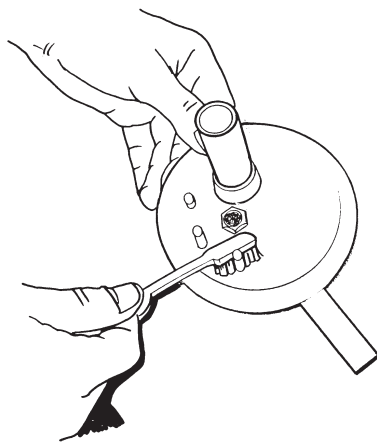
The parts of the sample tract which must be kept clean are as follows:

Intake Hose Assembly

Loosen the hose clamp to remove. Either flush out with clean water or replace.

Sample Chamber / Chamber Top

Remove the Sample Chamber assembly. (See Removing / Refitting the Sample Chamber, page 6.13)



Clean the Sample Chamber with a cleaning sponge using a detergent solution followed by a clean water rinse. Stubborn deposits may require a more aggressive cleaner.

Clean the Sample Chamber top in a similar manner but using brushes instead of a sponge. A small diameter bottle brush or similar can be used to clean the inside of the horizontal top pipe, and the vertical Volume Control Tube.

A small toothbrush (or similar) can be used to reach the base of the 3 electrodes and the inside surface of the chamber top between the electrodes. Clean the 3 electrodes both above and below the chamber top.

It is important when cleaning the Sample Chamber top to ensure that the inside surface, particularly between the electrode pins is kept free of wastewater contamination. Wastewater deposits can, when combined with condensation, (which often forms on the inside of the chamber top) form a conductive layer between the electrode pins which may lead to the occurrence of **PROBE SHORT CCT** and **GUARD PROBE HIT** faults.

Sample Collection Vessel

The method used to clean the Sample Collection Vessel will vary depending on which format is purchased. Generally, cleaning with a brush using detergent solution, followed by a clean water rinse is adequate. Please also note the following:

10 Litre Polypropylene Container Format:

Remove lid by flipping up the peripheral lip

25 Litre Polyethylene Container Format:

Remove the central access disc for cleaning.

12 x 0.75 Litre Glass Bottler Format:

Either clean in a bottle washer or replace.

12 x 1 Litre P.E.T. Bottler Format:

Either flush with clean water or replace.

Bottler Distributor Pipe

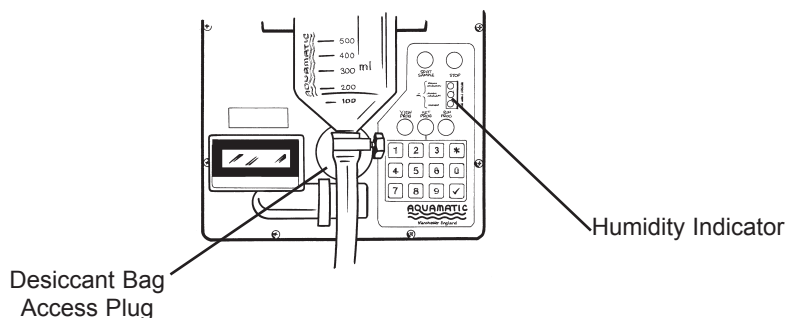
The Distributor Pipe can be removed from its retaining clip for cleaning if required. Again cleaning with a brush using detergent solution, followed by a clean water rinse is usually sufficient.

Keeping the Inside of the Sampler Module Dry

During normal operation the Sampler Module will gradually admit moisture (despite it being a nominally sealed enclosure).

The humidity level within the Sampler Module is indicated by the 3 Stage Humidity Indicator on the Keypad. All the circles on this indicator should show BLUE initially. As the humidity level in the Sampler Module gradually rises over time, the bottom (30% relative humidity), middle (40% relative humidity) and ultimately the top circle (50% relative humidity) change colour from BLUE to PINK.

It is recommended that as soon as the bottom circle starts to change colour, the Desiccant Bag be changed. The interval between Desiccant Bag changes is generally several months dependent on



the ambient conditions, to which the Sampler is exposed. To change the Desiccant Bag, proceed as follows:

- Remove the Sample Chamber assembly.
- Remove the Desiccant Bag Access Plug behind the Sample Chamber. (Push the plug into its recess to facilitate withdrawal.)
- Withdraw the Desiccant Bag and discard.
- Remove the new Desiccant Bag from it's sealed polythene storage bag.
- Placed the bag in the cavity in the front panel.
- Replace the Desiccant Bag access plug.

Test Mode

The Sampler has a test mode which is very useful in helping to diagnose fault conditions both within the Sampler and in its peripheral equipment. The test mode can also be useful during commissioning the Sampler. When in the test mode, the Sampler has the following facilities:

1. Provides a check on the total number of sample shots taken by the Sampler since manufacture.
2. Self checks the major operating components of the Sampler.
3. Verifies the validity of the signals from ancillary equipment fed to the Sampler's inputs.

4. Verifies the responses of ancillary equipment to signals fed from the Sampler's outputs.
5. Carries out calibration of the Sampler's temperature probe (provided that a comparative standard is available).

To enter the test mode, press and hold "STOP" button for about 7 seconds.

To return to the normal operating mode press "SET PROG" button.

The test routine is shown in the table below. After the initial display, use the * button to step from one test to the next one.

DISPLAY SHOWS		COMMENTS
total shots 000000001		Records total number of sample shots taken by the Sampler since its date of manufacture. This display only shows briefly.
test pump driving pump [test finished]	*	Press the ✓ button to exercise the pump. Listen to the pump and check for any spurious noises.
test level det 0514 [test finished]	*	Press the ✓ button to check the main level probe. The reading should be in the range 0500 to 0520 A reading below this range suggests that a conductive path exists between the 2 long electrodes. This probably means that the inside of the Sample Chamber top needs cleaning. A reading above this range suggests a bad contact between one or more of the spring contacts and its corresponding electrode.
test guard elec 0515 [test finished]	*	Press the ✓ button to check the guard level probe. The reading should be in the range 0500 to 0520 . A reading below this range suggests that a conductive path exists between the centre electrode and the short electrode. This probably means that the inside of the Sample Chamber top needs cleaning. A reading above this range suggests a bad contact between one or more of the spring contacts and its corresponding electrode.

DISPLAY SHOWS	COMMENTS
test supply 12.18 [test finished]	* Press the ✓ button to check the power supply under load. The reading should be in the range 11.00 to 12.25 . Note: This is not a voltage reading.
test valves driving valve 1 [driving valve 2] [driving valve 3] [test finished]	* Press the ✓ button to check valves 1 to 3 in turn. Listen for 3 clicks as the valves energise.
test acquired op driving output [test finished]	* (Optional) Press the ✓ button to generate a Sample Acquired output. Verify that any peripheral equipment responds appropriately.
test malfunc op driving output [test finished]	* (Optional) Press the ✓ button to generate a Sampler Malfunction output. Verify that any peripheral equipment responds appropriately.
test bottler	* (Optional) Press the ✓ button to drive the Bottler around to the Bottle 1 position. In this test the display shows: <div style="text-align: center;"> TESTING BOTTLER PLEASE WAIT </div> during the test, and the Bottler should start incrementing. When the Bottler reaches the Bottle 1 position the display will show: <div style="text-align: center;"> Bottler homed test finished </div> if the Bottler is operating correctly. If the Bottler is not operating correctly (or is not connected) the display will show: <div style="text-align: center;"> BOTTLER FAILED test finished </div> after about 60 seconds.
test impulse 00001 [test finished]	* (Optional) Feed contact closures between the Flow Input and the 0V connections of the Ancillary signal connection The counter should increment accordingly.

DISPLAY SHOWS		COMMENTS
test 4-20 loop 0001 [test finished]	*	<p>(Optional) Feed a current signal into the Samplers Ancillary Signal Connection. (Current +ve to the +5V connection and Current -ve to the Flow I/P connection). The following current signals should produce display readings within the following ranges:</p> <p>4mA (no flow) 0809-0829</p> <p>12mA (half scale flow) 0385-0405</p> <p>20mA (full scale flow) 0000-0000</p>
test remote in input open [input closed] [test finished]	*	<p>Feed a contact closure between the Remote Control Input and the 0V Input of the Ancillary signal connection. The display should go from input open to input closed.</p>
temp correction 24.0°C [test finished]	*	<p>With the Sample Temperature Probe immersed in a liquid, the temperature of which is monitored by a calibrated thermometer, adjust the reading to agree with that indicated by the calibrated thermometer.</p> <p>Press button to increment the reading by 0.1°C or press button to decrement the reading by 0.1°C. If the probe is faulty or not connected the display will show ??.?°C.</p>

Breakdown Service

There are no user serviceable parts on the Aquacell Sampler apart from those referred to in this User Guide. Where a problem is unable to be resolved with the aid of the User Guide, the following procedure should be followed:

Report the failure to Aquamatic, or it's approved Distributor. Often a telephone call is enough to resolve a perceived problem.

When a problem cannot be resolved over the telephone then there are two possible alternatives:

On-Site Service

Arrange for an engineer to come to site and carry out repairs – This is often the only practical option in the case of S200/S300 Series Samplers, particularly when the fault lies somewhere other than within the removable Sampler Module, the Removable Bottler or other items which can be easily returned.

Back to Base Service

Return the faulty item to Aquamatic, or it's approved Distributor, for repairs to be carried out in the workshop.

Proceed as follows:

Sampler Module

- Remove Sampler Module from its location and remove the battery (if fitted).
- Do not return the battery with the Sampler unless requested.
- Do not remove the Sample Chamber assembly from the Sampler.
- Pack Sampler Module (and battery [separately] if requested) in TRANSIT PACK. If you require a TRANSIT PACK please contact your supplier who will arrange for one to be forwarded to you.
- Return to Aquamatic Ltd. or it's approved distributor, for repair.

Removable Bottler

- Pack the Bottler in its original TRANSIT PACK if possible. If original packaging materials have been discarded please contact your supplier who will arrange for a new TRANSIT PACK to be forwarded to you.
- Return to Aquamatic Ltd or it's approved distributor, for repair.

Other faulty hardware which is readily detachable

- Either pack in original packaging if available, or use suitable alternative packaging materials.
- Return to Aquamatic Ltd or its approved distributor for repair.

NOTES:

- **It is most important to pack items securely such that movement of the items within the pack is prevented.**
- **The repair of transit damage is chargeable.**

Trouble Shooting

If your Sampler is not operating correctly check the fault symptoms against the following list. If you are unable to remedy the problem then refer to Aquamatic Ltd or your local dealer. See Breakdown Service above.

FAULT SYMPTOM	FAULT	ACTION
No Display.	Power off.	Connect power.
	Electronic fault.	Return for service.
Reduced sample lift capability / transport velocity	Partially blocked sample tract.	Clean sample tract.
	Leaking top clamp pneumatic connector.	Replace 'O' ring, stub pipe.
	Leaking chamber top Seal.	Replace 'O' ring, chamber top.
	Leaking pinch valve (bubbles rising through pinch valve seal).	Change pinch valve tube N.B. Often a new pinch valve tube will need to undergo several sample cycles before it seals properly.
	Leaking Intake Hose, or intake filter connection (excessive bubbles entrained in water entering Sample Chamber).	Check connections and seal.
	Pump inefficiency.	Return for service.
Sample shot sequence in error.	Internal pneumatic fault.	Return for service.
	Purge times are incorrectly set.	Check purge times and reset, if necessary.
	Internal pneumatic / electronic fault.	Return for service.

FAULT SYMPTOM	FAULT	ACTION
Samples not being kept at 5°C	Vent(s) blocked	Clean Vents (See page 7.1)
	Lower Compartment Door not fully closed	Close Door (or if the door has become misaligned, or the Door Seal damaged, request On-Site service)
	Condensate Drain blocked	Unblock Drain (See page 7.2)
	Refrigeration system faulty	Request On-Site service

In addition to the above Fault Symptoms the Sampler is able to detect and register various Warning Events. (See page 6.44 for more information). The following is a list of Warning Events with the Log Shot Form (which appears when the Warning log is examined, by pressing the View button), explanatory notes and a suggested course of action

IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE1	SHOT TIMED OUT	SHT T/OUT	The Sample Chamber Electrodes were not bridged by wastewater after a 68 sec intake phase.	<p>1) Ensure the Intake Filter is fully immersed. (see Intake Hose Installation, page 5.14).</p> <p>2) Clean the Sample Tract. (see page 7.2).</p> <p>Sampler in PPI Mode</p> <p>Check if the Heating System Fault light is on.</p> <p>Cont....</p>



IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE1Cont.				<p>If the light is on, request On-Site Service.</p> <p>If the light is not on, carry out actions 1) and 2), above.</p> <p>If the problem is still not resolved, Check the Display on the Millennium Controller within the PPI Housing ^[1]</p> <p>If this shows the "50,000 cycles, service needed" warning, request On-Site service</p> <p>If the warning is not shown, request On-Site service.</p>
WE2	GUARD ELECTRODE HIT	GUARD HIT	The Short (Guard) Electrode was hit before the Long Electrode.	Clean the Chamber Top / electrodes. (see Cleaning the Sample Tract, page 7.2). Cont....

[1] This operation should only be carried out by a skilled technician



IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE2Cont				Modify the installation to avoid splashing. (See Intake Hose Installation, page 5.14).
WE3	ELECTRODE OPEN CIRCUIT	OPEN CCT	A Sample Chamber Electrode / Contact Spring, failed to connect, when a sample was attempted.	Fit the Sample Chamber. Clean the tops of the electrodes where contact is made with the Contact Springs. (see Cleaning the Sample Tract, page 7.2). N.B. Contact Springs should project about 6mm from their location holes. If this is not the case, return the Sampler Module for service.
WE4	ELECTRODES SHORT CIRCUIT	SHORT CCT	A conduction path existed between the Sample Chamber Electrodes, when a sample was attempted, prior to the effluent being drawn into the Sample Chamber.	Clean the Chamber Top. (see Cleaning the Sample Tract, page 7.2) Modify the installation to avoid splashing. (see Intake Hose Installation (page 5.14).

IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE5	MAXIMUM SAMPLES REACHED	MAX SAMPS	The sample count reached that which had been programmed as a maximum permitted (to avoid the Sample Collection vessel overflowing).	No action needed.
WE6	FAULT-BOTTLER FITTED	BOT FITD	With the Sampler programmed to operate without a Bottler, an attempt to detect a Bottler found a Bottler to be fitted (i.e. a fault condition).	Either reprogram or remove the Bottler
WE7	FAULT-BOTTLER MISSING	BOT MISSG	With the Sampler programmed to operate with a Bottler, an attempt to exercise the Bottler failed.	Either reprogram or fit a Bottler
WE8	BOTTLER FAULT	BOT X	The Bottler failed to increment.	Ensure the Bottler Connector is fully engaged, and restart the program. If not successful, return the Bottler for service.

IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE9	SAMPLE TEMP SENSOR FAULT	ST SNSR X	With the Sampler programmed to measure / log Sample Temperature, the Sample Temperature Sensor was either missing or faulty.	<p>Samplers other than S300 Series:</p> <p>Ensure the Sample Temperature Sensor Connector, is fully engaged.</p> <p>Replace the Sample Temperature Sensor.</p> <p>If not successful, request On-Site Service.</p> <p>S300 Series Samplers:</p> <p>Request On-Site Service.</p>
WE10 ^[1]	PLANT ZONE TEMP SENSOR FAULT	PZT SNSR X	The Plant Zone Temperature Sensor was either missing or faulty	Request On-Site Service.
WE11 ^[1]	CONTAINER ZONE TEMP SENSOR FAULT	CZT SNSR X	The Container Zone Temperature Sensor was either missing or faulty	Request On-Site Service.



IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE12 ^[1]	EVAP PLATE TEMP SENSOR FAULT	EPT SNSR X	The Evaporator Plate Temperature Sensor was either missing or faulty	Request On-Site Service.
WE13 ^[1]	DEFROST TIME OUT	DFRST T/ OUT	The evaporator plate failed to reach 3°C during a defrost cycle	Close the door of the Lower Compartment. Cont....
WE13 ^[1]Cont				If not successful, request On-Site Service.
WE14 ^[1]	CONTAINER ZONE TEMP OUT OF RANGE	CZ TEMP OUT	The Container Zone temperature was out of the 0 -5°C window permitted (or below 0°C in the case of S310H)	Wait until the Lower compartment has had time to get down to 5°C (about 30 minutes at an ambient temperature of 20°C Close the door of the Lower Compartment. If not successful, request On-Site Service.



IDENT	EVENT	LOG SHORT FORM	NOTES	ACTION
WE15 ^[1]	CONTAINER ZONE TEMP IN RANGE	CZ TEMP IN	The Container Zone temperature was within the 0 -5°C window permitted (or above 0°C in the case of S310H)	No action needed.
WE16	SUPPLY VOLTAGE LOW	LOW VOLTS	The supply voltage fell below the minimum permitted	Restore the supply voltage to the correct level

[1] These Warning Events only apply to S300 Series Sampler Models



MAINTENANCE

7.18

8

TECHNICAL SPECIFICATIONS

Aquacell Sampler Module

Media/Source suitability	Wastewater from a non-pressurised sampling point
Sample extraction method	Air pump vacuum system
Operating Modes	<p>Time – Sampling frequency from 1 min to 99 hrs 59 mins</p> <p>Flow – 4-20mA or pulsed volt-free contact closure</p> <p>Event – Controlled by external equipment (such as a pump or pH Meter etc.) providing volt-free on / off contact</p>
Data Logging	<p>Up to 1012 Sampling Events / Warning Events are logged for interrogation using the Sampler's View Menu.</p> <p>Sample Temperature logging is also available if the (Optional) Sample Temperature Monitoring is incorporated.</p>
Maximum lift height	> 7 metres
Transport velocity	0.5 metres / sec (average) with 7 metre lift
Sample shot volume range	<p>Single shot 20 - 500 ml (larger total sample volume can be achieved through programmable multiple shots / sample).</p> <p>100ml maximum shot size for Samplers used with 12 Bottle Removable Bottlers</p>



Sample shot cycle time	30 seconds (approximately) with 4 metres lift
Maximum sample media temperature	60°C

Materials of construction

Main Enclosure	Sealed polyurethane moulded construction with stainless steel fittings.
Sample Chamber	Acrylic or Glass (optional)
Sample Chamber Top	Standard - Polypropylene / Stainless Steel / Silicone Rubber Optional – PTFE / Stainless Steel / Silicone Rubber
Intake Hose with Filter	Standard - Braided PVC / Stainless Steel Optional - Braided PTFE / Stainless Steel
Sample Collection Vessels	See Data Table, page 8.7, for details

Mechanical Features

User interface	17 button keypad incorporating tactile keys LCD, 16 x 2 alpha numeric, backlit.
Intake Hose	10 metre long (5 meter with S50) with Stainless Steel Intake Filter (cut to length to suit application)
Sample tract diameter	12mm increasing to 16mm between Intake Filter and sample discharge
Humidity control	The Sample Module contains a Replaceable Desiccant Bag with 3 stage Humidity Indicator visible through a window in the key pad

Optional Connections

Ancillary Signal Connection

Available via a 1.5 metre cable (S50/S100/S200 models), or a Terminal block (S300 Series models). The Ancillary Signal Connection features the following:

Instantaneous flow input Accepts 4-20 mA into 255 ohm

<i>Pulsed flow input</i>	Accepts normally open volt free contact closure
<i>Remote control input</i>	Accepts normally open volt free contact closure - Event controlled by signal from an external device such as a pump or pH Meter etc...
<i>Sample acquired output</i>	Provides a contact closure each time a sample enters the Sampler Chamber. 1 normally open volt free 50VDC 1A rated contact pair will close for 2 seconds when the sample induction phase is terminated by wastewater bridging the 2 longer electrodes in the Sample Chamber
<i>Sampler warning output</i>	Provides a contact closure when one or more warning conditions occur. 1 normally closed volt free 50VDC 1A contact pair will open for 2 seconds (or longer in the case of power outage) when one or more warning conditions occur

USB Connection

Up to 1012 Sampling Events / Warning Events can be downloaded to a PC using a USB cable connected to the USB connector on the Sampler Module front panel.

Up to 42 days of 5 minute interval, Sample Temperature readings are also available if the (Optional) Sample Temperature Monitoring is incorporated.

Pressurised Pipeline Interface (PPI)

The PPI has 2 formats - the Standard Format and the S300 Format

PPI - Standard Format	For use with S50, S100 and S200
PPI - S300 Format	For use with S300 Series
Media / Source suitability	Wastewater from a pressurised sampling point
Maximum wastewater particulate size (mm)	10

Minimum Sampling point pressure	Sufficient to generate a 0.5 metre / second flow in the Intake Hose
Maximum Sampling point pressure (bar)	6.0
Maximum intake hose length (metre)	10
Size (mm) / Weight (kg) of the PPI Enclosure	Height 1100 Width 520 Depth 250 Weight 18.0
Note: the PPI, S300 Format enclosure attaches to the right hand side of the S300 Cabinet	
Environmental	Same as the Sampler Model that the PPI is supplied with
Power Supply	Same as the Sampler Model that the PPI is supplied with
Power Consumption (VA)	300

Aquacell Wastewater Sampler Model Range

Notes

- 1. None of the Aquacell models are suitable for use in Classified Hazardous Areas
- 2. All of the Aquacell models incorporate the Aquacell Sampler Module
- 3. S300 Series Sampler Models - Cabinet panels have been subjected to extensive salt spray testing (in line with BS 3900 part F12 (also known as ASTM B117 and DIN 52-021)). This accelerated test is equivalent to an estimated 15 years in a typical outdoor application

Standards Compliance

All of the Aquacell models are compliant with the following standards:

- MCERTs – Continuous Water Monitoring Equipment Certification.
- Water quality - Sampling - Part 10: Guidance on sampling of wastewaters ISO 5667 – 10
- CE Marked and complies with the following EC Directives:
 - EMC 2004/108/EC
 - Low Voltage Directive 2006/95/EC

Data Table

A full Technical Specification for each model in the Aquacell Stationary Wastewater sampler range, can be derived by combining the following Data Table with the above Technical Specification for the Aquacell Sampler Module and (if appropriate) the above Technical Specification for the Pressurised Pipeline Interface

Note: ● Supplied as standard ○ Optional

Model		S50	S100	S200	S310	S310H	S320	S320H
General	MCERTS Certified	●	●	●	●	●	●	●
	Two Compartment Cabinet Enclosure				●	●	●	●
	Sample Frost Protection					●	●	●
	Sample Temperature Control			●			●	●
Environmental	IP Rating	50	65	50	54	54	54	54
	Minimum Ambient Temperature (°C)	-10	-10	5	5	-10	5	-10
	Maximum Ambient Temperature (°C)	50	50	40	50	50	40	50
Power Supply	110/220/230V AC 50Hz	●	●	●	●	●	●	●
	Float Charged Back-up Battery 12V DC 7Ah	○	○	○	○	○	○	○
Power Consumption	Power (VA) @ 110V AC	60	60	335	98	598	433	598
	Maximum Inrush current (A) 110V AC			24			24	24
	Power (VA) @ 220V AC	60	60	335	94	549	398	549
	Maximum Inrush current (A) 220V AC			9			9	9
	Power (VA) @ 230V AC	60	60	335	98	598	433	598
	Maximum Inrush current (A) 230V AC			9			9	9

Construction (also see Sampler Module construction)	Model					
	Stainless steel mounting bracket.	●				●
	Plastic moulded cover and stainless steel mounting brackets / fittings.	●				
	Galvanised Steel cabinet, pre-treated and finished with architectural grade white polyester powder coating, plus stainless steel panel.			●		
	Stainless steel cabinet base with Galvanised Steel, superstructure pre-treated and finished with architectural grade white polyester powder coating plus stainless steel fittings.					●
	Lower Compartment insulation: Expanded Polyurethane Pentane blown foam.					●
	S50	●				
	S100	●	●			
	S200			●		
	S310					●
	S310H					●
	S320					●
	S320H					●

Size and Weight	Model	S50	S100	S200	S310	S310H	S320	S320H
	Height (mm)	290	330	1250	1450	1450	1450	1450
	Width (mm)	290	300	500	730	730	730	730
	Depth (mm)	240	250	600	770	770	900	900
	Weight (Kg) (excluding Sample Collection vessel)	7.5	8.0	46.0	101.0	103.0	118.0	120.0
Sample Collection Vessel Compatibility continued....	10 litre Polypropylene Container	○	○	○	○	○	○	○
	25 litre Polyethylene Container	○	○	○	○	○	○	○
	2 x 4.5 litre Self-Emptying Polypropylene Bottler	○	○					
	2 x 4.5 litre Self-Emptying Polypropylene Integral Bottler				○	○	○	○
	4 x 5 litre Glass Bottler	○	○	○	○	○	○	○
	4 x 5 litre Glass Integral Bottler				○	○	○	○
	4 x 5 litre HDPE Bottler	○	○	○	○	○	○	○
	4 x 5 litre HDPE Integral Bottler				○	○	○	○
	4 x 12 litre Polyethylene Integral Bottler				○	○	○	○
	12 x 0.75 litre Glass Bottler	○	○	○	○	○	○	○
	12 x 1 litre HDPE Integral Bottler				○	○	○	○

...continued Sample Collection Vessel Compatibility	Model	S50	S100	S200	S310	S310H	S320	S320H
	12 x 1 litre Glass Integral Bottler				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	12 x 1 litre PET Bottler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	24 x 1 litre HDPE Bottler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Please see Aquamatic website www.aquamaticsamplers.com for current data sheets on all Aquamatic samplers

Aquamatic Wastewater Sampling Equipment is used by a wide range of International companies and Organisations, including many well known names such as ABB, BNFL, Cadburys Schweppes, Heinz, Rolls Royce and Veolia. Additionally Aquamatic Wastewater Samplers are currently being used at many of the major Water Companies, both UK and Worldwide



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